

The Oxford Handbook of Neolithic Europe

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≡ The Oxford Handbook *of*
NEOLITHIC
EUROPE

THE OXFORD HANDBOOK OF
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Edited by

CHRIS FOWLER, JAN HARDING,

and

DANIELA HOFMANN

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PREFACE

THIS book is an ambitious project, involving over 70 authors working in more than 45 different institutions in 15 countries. We would like to thank all the authors for their hard work. A number of contributors agreed to co-author chapters with specialists they had not worked with before, sometimes based in different countries, and we have been delighted with the degree of cooperation and collaboration between them. This has been vital in producing a series of chapters that work across the national and regional boundaries which have often deflected archaeologists from synthesis at a scale that matches that of Neolithic phenomena. With a work of this scope, it is perhaps inevitable for delays to occur, and we would like to thank all contributors for their patience during this process.

First conceived in 2007, the *Oxford Handbook of Neolithic Europe* provides summaries of key debates that are ongoing and will remain current over coming years. The future is bright and exciting, and the chapters in the volume aim to function as valued waypoints, marking out how that future looks now and outlining how scholars have arrived at their present positions. Many authors reflect on emerging and future research at the time of writing; some have marked their chapters with a 'date stamp' indicating the last time that content was updated to put it in precise context, but all of the trends and trajectories identified remain valid at the time of press. Nonetheless, the European Neolithic is a very dynamic field of study, with every year yielding further projects on varied aspects of life in this period; just in the lifetime of the production of this volume there have been numerous significant developments in radiocarbon dating and chronologies, palaeo-genetics, and the application of stable isotope analyses, to name just a few. No such work can be exhaustive, but this volume aims to be highly representative and as comprehensive as possible, both in terms of the regions and material covered and analytical methods and interpretative approaches.

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or errors are identified with copyright acknowledgements we undertake to investigate these and if appropriate correct the information in any future edition. The editors would like to thank John Robb for supplying the base maps adapted for Maps 1–4.

We would like to thank Hilary O'Shea for commissioning the volume, three anonymous reviewers of the initial proposal for their constructive comments, Taryn Das Neves, Annie Rose, and Michael Dela Cruz at OUP for producing the hard copy and online versions of the book, and Sivaraman G, Janish Ashwin, and Prashanthi Nadipalli, Sunoj Sankaran at Newgen for their work with the copy-editing.

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- 56.1 Model of basic material and institutional components of western Eurasian societies of the third millennium BC.

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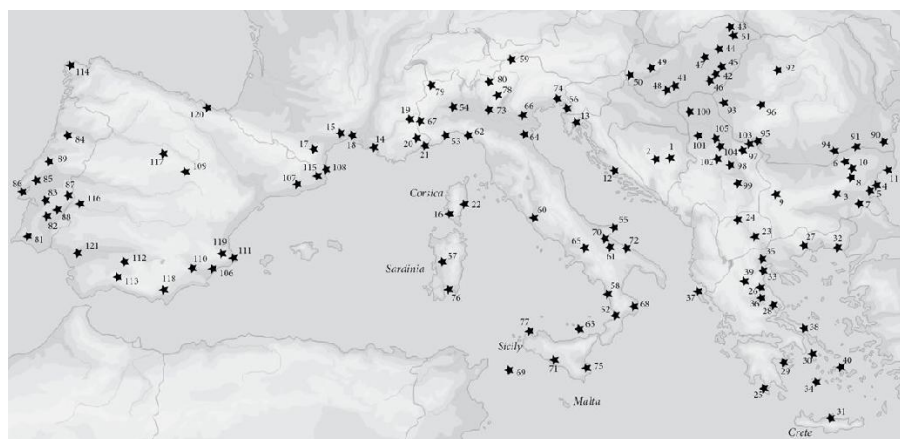
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MAP 1 Map of main regions and geographical features mentioned in the volume. 1 = Alentejo; 2 = Almería; 3 = Colline Metallifere; 4 = Lunigiana; 5 = Tavoliere; 6 = Valais.

Base map drawn by Jane Mathews and supplied by John Robb.

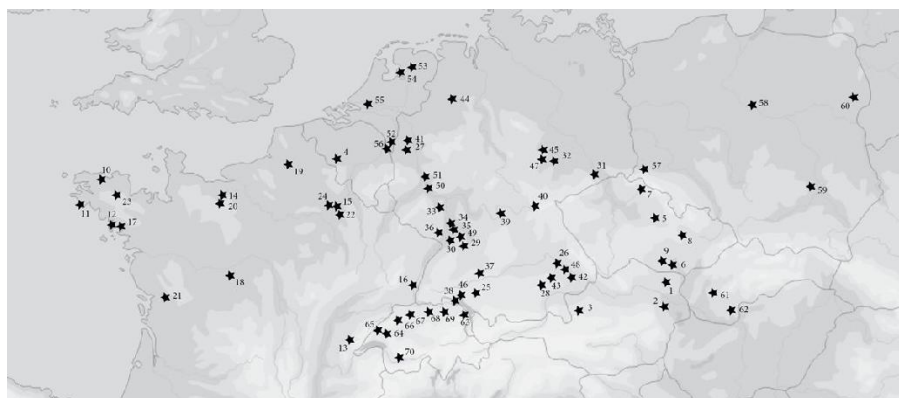


MAP 2 Selected sites in Mediterranean and south-east Europe mentioned in the volume (alphabetically by country):

Bosnia: Obre (1); Okolište (2) – **Bulgaria:** Ai Bunar (3); Durankulak (4);

Goljamo Delchevo (5); Kamenovo (6); Karanovo (3); Orlovo (7); Ovcharovo (8); Poljanitsa (8); Slatina (9); Targovishte (10); Varna (11) – **Croatia**: Danilo (12); Pupicina cave (13) – **France**: Camp-de-Laure (14); Causses plateau (15); Filitosa (16); Gazel cave (17); Le Crès (18); Les Oullas (19); Mont Bégou (20); Pendimoun (21); Saint-Véran (19); Terrina (22) – **FYROM**: Anza/Anzabegovo (23); Tumba Madjari (24) – **Greece**: Alepotrypa cave (25); Argissa (26); Dikili Tash (27); Dimini (28); Franchthi cave (29); Kephala (30); Knossos (31); Makri (32); Makriyalos (33); Melos (34); Nea Nikomedeia (35); Plateia Magoula Zarkou (36); Sesklo (28); Sidari (37); Sitagroi (27); Skoteini cave (38); Soufli Magoula (26); Theopetra cave (39); Zas cave (40) – **Hungary**: Alsónyék (41); Berettyóújfalu (42); Bodrogkeresztúr (43); Csőszhalom (44); Ecsefalva (42); Endrőd (45); Hódmezővásárhely (46); Kisköre (47); Lengyel (48); Szentgál (49); Szentgyörgyvölgy (50); Tiszapolgár-Basatanya (51); Zengővárkony (48) – **Italy**: Acconia (52); Arene Candide (53); Bottegghino (54); Defensola (55); Edera (56); Filiestru cave (57); Grotta della Monaca (58); Hauslabjoch/Ice Man (59); La Marmotta (60); Lagnano da Piede (61); Libiola (62); Lipari (63); Lugo di Romagna (64); Mirabello Eclano (65); Molino Casarotto (66); Monte Loreto (62); Monte Viso (67); Neto (68); Pantelleria (69); Passo di Corvo (70); Piano Vento (71); Pulo di Molfetta (72); Remedello (73); Sammardenchia (74); Stentinello (75); Su Coddu (76); Uzzo cave (77); Valcamonica (78); Valle d'Aosta (79); Valtellina (80) – **Portugal**: Alcalar (81); Angerinha (82); Anta Grande do Zambujeiro (83); Antelas (84); Cabeço da Arruda (85); Escoural (83); Leceia (86); Mocissos (87); Olival da Pega (88); Vila Nova de São Pedro (85); Zambujal (89) – **Romania**: Cernavodă (90); Gumelnița (91); Gura Baciului (92); Iclod (92); Parța (93); Pietrele (94); Schela Cladovei (95); Turdaș (96); Uivar (93) – **Serbia**: Belovode (97); Blagotin (98); Divostin (99); Donja Branjevina (100); Gomolava (101); Grivac (102); Lepenski Vir (103); Padina (103); Rudna Glava (103); Selevac (104); Starčevo (105); Vinča (105); Vlasac (103) – **Spain**: Almizaraque (106); Bóbila Madurell (107); Ca n'Isach (108); Casa Montero (109); Cerro de la Virgen (110); Cueva de les Cendres (111); Cueva de los Murciélagos (112); Cueva de Toro (113); Dombate (114); La Draga (115); La Pijotilla (116); La Vaquera (117); Los Millares (118); Mas D'Is (119); Pico Ramos (120); Terrera Ventura (118); Valencina de la Concepción (121).

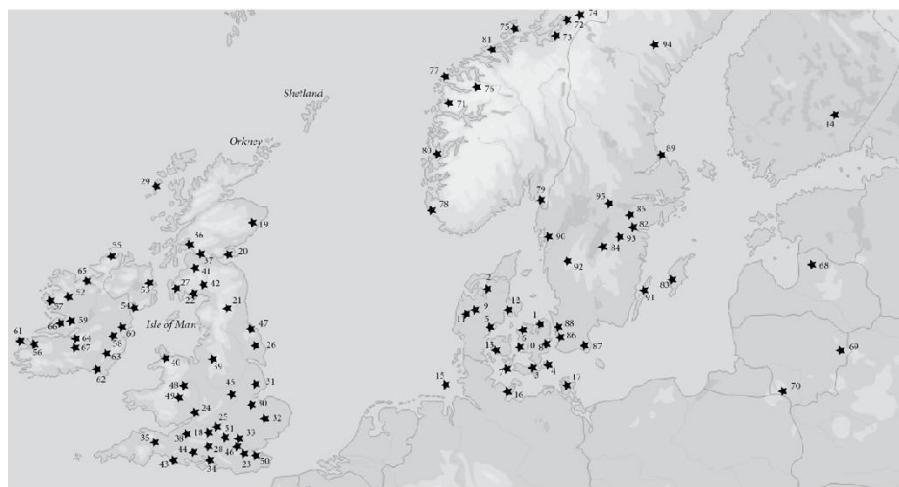
Base map drawn by Jane Mathews and supplied by John Robb.



MAP 3 Selected sites in central Europe mentioned in the volume (alphabetically by country):

Austria: Asparn-Schletz (1); Brunn-Wolfholz (2); Friebritz (1); Mondsee (3) – **Belgium:** Spiennes (4) – **Czech Republic:** Bylany (5); Dolní Věstonice (6); Jistebko (7); Miskovice (5); Těšetice (8); Vedrovice (9) – **France:** Barnenez (10); Beg an Dorchenn (11); Carnac (12); Clairvaux (13); Chalais (13); Condé-sur-Ifs (14); Cuiry-lès-Chaudardes (15); Ensisheim (16); Gavrinis (17); Grand-Pressigny (18); La Chaussée-Tirancourt (19); La Hoguette (20); Locmariaquer (17); Menneville (15); Prissé-la-Charrière (21); Romigny/Lhéry (22); Sélédin (23); Table des Marchand (17); Tumulus de Saint-Michel (12); Villeneuve-Saint-Germain (24) – **Germany:** Aichbühl (25); Aiterhofen (26); Aldenhovener Platte/Merzbach valley (27); Altheim (28); Bad Cannstatt (29); Bruchsal (30); Dresden-Prohlis (31); Dürrenberg (32); Federsee (25); Flomborn (33); Goseck (32); Heidelberg-Handschuhsheim (34); Heilbronn-Klingenberg (35); Herxheim (36); Hetzenberg (35); Hohlestein (37); Hornstaad (38); Ippenheim (39); Jülich (27); Jungfernhöhle (40); Kückhoven (41); Künzing-Unternberg (42); Meisterthal (43); Michelsberg-Untergrombach (30); Rheine (44); Rheindürkheim (33); Rheingewann (33); Rössen (32); Salzmünde (45); Sipplingen (46); Sondershausen (47); Stephansposching (48); Talheim (49); Trebur (50); Urmitz (51); Vaihingen (29); Wiederstedt (45); Wiesbaden-Erbenheim (50) – **Netherlands:** Beek (52); Buinen (53); Eext (53); Elsloo (52); Emmeloord (54); Geleen (52); Molenaarsgraf (55); Rijckholt (56) – **Poland:** Bozejewice (57); Brześć Kujawski (58); Krzemionki (59); Olszanica (60) – **Slovakia:** Nitra (61); Svodín (62) – **Switzerland:** Arbon-Bleiche (63); Arconciel (64); Auvernier (65); Bielersee (66); Breitenloo (63); Burgäschisee (67); Egolzwil (68); Lake Zürich (69); Marin (65); Sion (70).

Base map drawn by Jane Mathews and supplied by John Robb.



MAP 4 Selected sites in northern and north-west Europe mentioned in the volume (alphabetically by country):

Denmark: Bautahøj (1); Bjørnsholm (2); Bogø (3); Bornholm (4); Bygholm Nørremark (5); Dragsholm (6); Fakkemose (7); Hanstegård (8); Klokkehøj (9); Lindebjerg (10); Muldbjerg (11); Poskær Stenhus (12); Sarup (13) – **Finland:** Astuvansalmi (14) – **Germany:** Helgoland (15); Rosenhof (16); Rügen (17) – **Great Britain:** Avebury (18); Balbridie (19); Balfarg (20); Briar Hill (21); Cairnholly (22); Coldrum (23); Crickley Hill (24); Dorchester-on-Thames (25);

Duggleby Howe (26); Dunragit (27); Durrington Walls (28); Eilean Domhnuill (29); Etton (30); Giant's Hills (31); Grimes Graves (32); Haddenham (33); Hambledon Hill (34); Hazelton North (24); Hembury (35); Kilmartin Glen (36); Kilverstone (32); Knap Hill (18); Knappers (37); Knowlton (38); Lismore Fields (39); Llandegai (40); Lochhill (41); Lockerbie (42); Maumbury Rings (43); Monkton Up Wimborne (44); Rothley Lodge Park (45); Rudston (26); Runnymede Bridge (46); Slewcairn (22); Stonehenge (28); Street House (47); Sweet Track (38); Trelystan (48); Upper Ninepence (49); West Kennet (18); White Horse Stone (50); Windmill Hill (18); Yarnton (51) – **Ireland:** Ballyglass (52); Ballyharry (53); Ballymacdermot (54); Carrowkeel (55); Cloghers (56); Connemara (57); Corbally (58); Corlea (59); Dowth (60); Ferriter's Cove (61); Kilgreany cave (62); Knowth (60); Linkardstown (63); Lough Gur (64); Magheraboy (65); Newgrange (60); Parknabinnia (66); Tankardstown (67) – **Latvia:** Zvejnieki – **Lithuania:** Kretuonas (69); Turlojiškė (70) – **Norway:** Ausevik (71); Bardal (72); Evenhus (73); Hammer (74); Hitra (75); Hjelle (76); Leirfall (73); Mjeltehaugen (77); Oga (78); Røkke (79); Stakaneset (80); Vevang (81); Vingen (77); Voll (78) – **Sweden:** Åby (82); Ajvide (83); Alvastra (84); Bollbacken (85); Borgeby (86); Carlshögen (87); Dagstorp (88); Fräkenrönningen (89); Frälsegården (90); Kivik (87); Köpingsvik (91); Landbogården (92); Linköping (93); Malmö (86); Nämforsen (94); Piledal (87); Ramshög (87); Skumparberget (95); Turinge (93); Ystad (87).

Base map drawn by Jane Mathews and supplied by John Robb.

PART I

INTRODUCTION

CHAPTER 1

THE OXFORD HANDBOOK OF NEOLITHIC EUROPE

An Introduction

CHRIS FOWLER, JAN HARDING, AND DANIELA HOFMANN

INTRODUCTION

STUDIES of the European Neolithic have changed considerably and diversified significantly over the past 50 years. Forms of evidence have been brought into the fold through the expansion of types of archaeological fieldwork and scientific analyses, from rock art studies to the analysis of DNA and stable isotopes in human skeletal remains. Calibrated radiocarbon chronologies have had a major impact on understanding sequences of prehistoric activity. New perspectives have also been developed, with a shift in emphasis from geographically sweeping generalizations to more fine-grained and often regionally specific accounts. This has been accompanied by an interest in new themes for analysis, including exploration of Neolithic landscapes, cosmologies, bodies, and personhood. Yet for a long time there has been no single volume that combines all of these forms of evidence and perspectives in a comprehensive and detailed study of the European Neolithic from Iberia to Russia and from Norway to Malta. This volume attempts to remedy this by bringing together the research of leading experts from across Europe into a wide-ranging discursive resource suitable for undergraduates, postgraduates, and more experienced scholars of the Neolithic. Its chapters disseminate the results of recent research, but importantly also set out agendas and themes for future work. As such, the book combines up-to-date syntheses with current innovative thinking, to both inform and inspire the reader. It ends with three commentaries which stand back from the detail and develop key debates for Neolithic studies. Contributors come from different archaeological traditions and perspectives, working in different languages and through different media. In inviting this range of contributors the editors sought to portray the strength and diversity of Neolithic archaeology across Europe, whilst providing the reader with as comprehensive and detailed a coverage as could be achieved within the confines of one book.

DEFINING THE ‘NEOLITHIC IN EUROPE’

The timescale and duration of the Neolithic vary greatly from region to region. We consider the period from c. 6500 BC, when a Neolithic lifestyle is identified in parts of Greece, to c. 2500 BC when it reached northernmost Europe (though some contributions mention later evidence). Given this broad chronological frame, the book also touches on many ‘Mesolithic’, ‘Chalcolithic’, or even ‘Bronze Age’ societies, and indeed, the way in which these communities co-existed and interacted with ‘Neolithic’ societies is at the heart of investigating process, change, invention, and adoption just as much as interactions within and between differing ‘Neolithic’ communities. There is considerable variation in how the Neolithic is chronologically subdivided, and there is a bewildering array of different schemata and cultural labels across the continent (Fig. 1.1), built up according to different criteria. This does not, however, preclude the existence of broad trends. For instance, a recurring theme for large parts of Europe is the distinction between the early Neolithic and late Neolithic (e.g. Müller, [Chapter 3](#); Schier, [Chapter 5](#); Malone, [Chapter 9](#); cf. [Hodder 2013](#)). The importance of transformation throughout the period is such that we can even question the extent to which it is meaningful to talk of ‘a Neolithic’, or, for that matter, ‘a Mesolithic’ or ‘a Chalcolithic’ (see, e.g., [Allen et al. 2012](#); [Lichardus 1991](#); [Pluciennik 2008](#)).

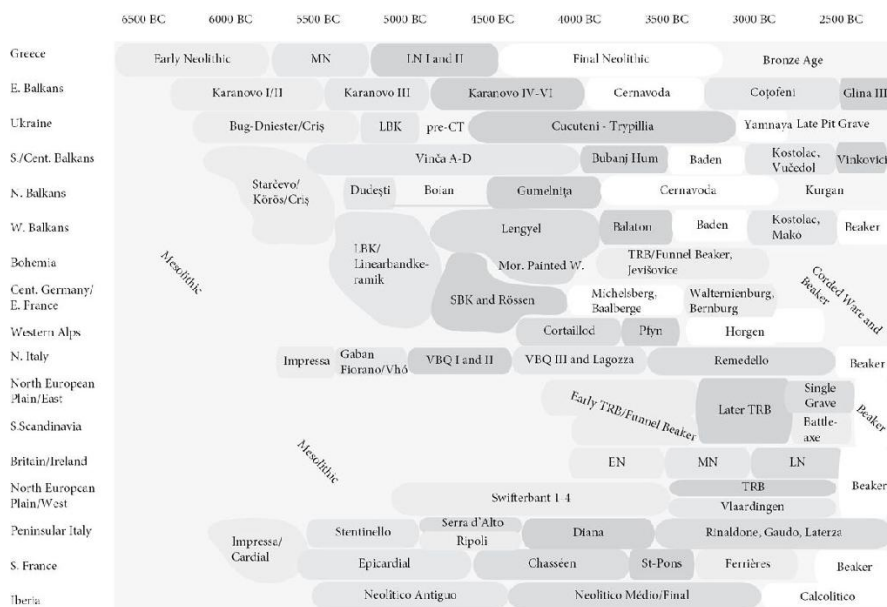


FIG. 1.1. Schematic representation of main archaeological cultures by key area.

This is intended as a general guide only; not every grouping or geographical area could be covered, and details (especially regarding dates) are debated and constantly being revised. Spellings may also vary between regions and researchers. Abbreviations: EN = early Neolithic; MN = middle Neolithic; LN = late Neolithic; CT = Cucuteni-Tripillia; Mor. Painted W. = Moravian Painted Ware; TRB = Trichterbecherkultur (= Funnel Beaker culture). Information has been synthesized from the following sources: [Bagolini 1992](#); [Cipolloni Sampó 1992](#); [Louwe Kooijmans 2007](#); [Lüning 1996](#); [Mottes et al. 2002](#); [Strahm 1994](#); [Whittle 1996](#). Advice on Iberia is courtesy of Ana Vale. Thanks also to John Chapman and Andrea Dolfini for critical comments.

Indeed, the meaning of the term ‘Neolithic’ is constantly debated, and consequently so are the criteria used to define the archaeological presence of Neolithic communities. The identification of agriculture is usually paramount, although this still varies between European regions, and in some places the presence of polished stone or pottery is taken to indicate a Neolithic community (e.g. [Kunst 2010](#); [Barker 2006](#), among many others). More radically, the Neolithic has also been defined as a way of thinking about and reorganizing the world ([Hodder 1990](#); [Thomas 2013](#)), or even as nothing more than a range of material and symbolic media that could be adopted and transformed by communities through a creative process of identity generation ([Thomas 1988](#)). [Robb \(2013\)](#) has recently argued that the Neolithic was initially characterized by varied novel relations between people, things, animals, and places, and decisions taken with the short or medium term in mind, but that this diversity and flexibility increasingly led to a series of emerging and converging unintended consequences, resulting in a widespread long-term process of transformation that could not be undone. In two commentaries closing this volume, Thomas ([Chapter 55](#)) and Kristiansen ([Chapter 56](#)) interpret the Neolithic as a form of social organization predicated on distinctive relations with things, places, and animals, competitive communities, and the control of wealth. As both Thomas and Kristiansen suggest, the simple presence or absence of certain material traits by themselves are not the right basis from which to identify communities as Neolithic or otherwise, but this does not mean period terms are redundant. Neolithic communities were diverse and varied, just as Mesolithic ones were, but we cannot escape the fact that almost everywhere in Europe and in most respects Neolithic communities became quite different from Mesolithic ones.

Underlying these various interpretations is the idea that the Neolithic was a way of life, a way of getting on in and with the world; what exactly this involved varied over time and across space, but that degree of variation was elastic to the extent that archaeologists still think it valuable to talk about some societies as Neolithic and others as Mesolithic or Bronze Age. It is particularly interesting that Thomas

and Kristiansen emphasize that there is something distinctive about Neolithic communities, given that improvements in how chronologies are produced mean it is now possible that future generations of Neolithic scholars will be able to locate their studies in terms of specific centuries, or even decades (Whittle and Bayliss 2007; Whittle et al. 2011)—as has long been possible in the rare areas of Europe with exceptional dating evidence (Billamboz 2012). Dramatically improved chronological resolution may support discussion of certain centuries across a large area, encourage the consideration of more sophisticated models of coexistence between different kinds of society and stimulate further reflection on processes of change. The debate over whether or not we should term certain communities ‘Neolithic’, and what this means, will not end any time soon, but it should become more precise and refined in step with these improved chronological frameworks.

Much research into the European Neolithic has been completed within defined national boundaries and often according to national traditions and agendas, making comparisons between areas difficult. In addition, a region may show strong affinities with one area in one Neolithic phase, and with a different area in another. This makes creating and adhering to geographic limits complicated. Here it was decided that the geographical remit would be as comprehensive as possible. As a very general guide, four macro-regions are represented in most sections of the book: south-east Europe (broadly covering Greece and the Balkans up to Hungary and reaching as far east as Bulgaria), central and eastern Europe (from eastern France into eastern Russia), northern and western Europe (the Baltic, the North European Plain, the Atlantic façade of Portugal and France, and the British Isles), and the Mediterranean (including Italy, southern France, and Spain). Inevitably, coverage of some of these areas is stronger than others. There is a weakness in the coverage of eastern Europe, and more specifically Russia and the countries which achieved independence after the collapse of the Soviet Union. Similarly under-represented is interaction between the southern European fringe of the Mediterranean and northern Africa. The exploration of these eastern and southern ‘extensions’ to the European Neolithic offer an exciting agenda for future research which could not be exploited here. Our contributors, do, however, extensively investigate connections within Europe. As a result, landscapes and regions often become collated into larger geographic entities, and frequent reference is made to ‘northern’ or ‘north-western Europe’, ‘central Europe’, and ‘eastern Europe’. We did not predefine these, and so there is inevitably some variation in what is meant by each term. But the resulting freedom for contributors has enabled them to break free of traditional limits like

national borders and create accounts which emphasize interaction and pan-European processes: indeed, authors were often encouraged to collaborate in order to provide expertise that crossed national boundaries and operated at the scale of the archaeological phenomena under investigation.

SCALES OF TIME AND SPACE: STUDYING BIG ISSUES FROM FRAGMENTARY AND SPECIFIC EVIDENCE

Dividing the book into thematic parts and constituent sections facilitates comparison across regions and between the chronological sub-divisions of the Neolithic. Arranging the material in this way has shown that in spite of our often tightly focused specialisms and differing traditions of research, Neolithic specialists from different regions grapple with many of the same problems. This is most evident when considering the archaeological evidence for *Mobility and interaction at the large scale*, with which this volume begins. Sections on the *Movement of plants, animals, ideas and people* and *Sequences of cultural interaction and cultural change* highlight the shared research agendas across Europe. In contrast to many of the important existing publications on the matter (e.g. [Whittle and Cummings 2007](#); [Gronenborn and Petrasch 2010](#), amongst many others), this section does not focus on the Mesolithic–Neolithic transition alone, but reflects on these factors throughout the Neolithic, their possible role in innovation and change, and whether different processes were responsible for dissemination over time and across space. As such, it provides broad overviews of the landscape and climate of the European landmass and the cultural development in each of the four main regions. These accounts of macro-process are preceded by an initial discussion of the physical and environmental opportunities and constraints found across Europe (Brown et al., [Chapter 2](#)), and a contribution (Shennan, [Chapter 7](#)) on relationships between the movements of languages, genes, practices, and people. Chapters in this section remind us of different, locally varied rates of change that mesh with or gel into large-scale trends and long-term processes. For instance, Brown et al. report that fluctuations in climate may relate to shifting subsistence practices in some cases, but seemingly not to widespread changes in material culture. Longer-term patterns can also be set alongside the impact of single events and relatively sudden changes, such as the long-distance diffusion of new products, practices, and people from the outset of and during the Neolithic (cf. [Rowley-Conwy 2011](#); Tresset, [Chapter 6](#)). Indeed, such events and larger processes of change are arguably inseparable (see also [Bolender](#)

2010).

The section on *Sequences of cultural interaction and cultural change* complements many of these themes by exploring in greater detail the issues of cultural interaction, stability, and transformation. The transition in European Russia and parts of the Baltic was long and drawn out. Here ceramics were used for centuries by those practising hunting, gathering, and fishing, and persisted as agricultural practices spread in the region. These northern ceramic traditions developed independently from those of south-east and central Europe, where the initial spread of the Neolithic was more rapid. Even when ceramics derived from central European farming traditions appeared in parts of southern Scandinavia they were not always used for agricultural products: analysis of lipids and charred remains in early Neolithic TRB (Funnel Beaker) vessels from Denmark reveal dairy products for some vessels and freshwater fish for others, for instance (Craig et al. 2011). In central and south-east Europe dramatic but patchy expansion over a large area was often followed by processes of geographical infilling and a variety of other locally varied processes such as increasing levels of sedentism, settlement nucleation, and/or cultural fragmentation (Chapman, Chapter 8). When new areas were again settled, this was often accompanied by a marked change in material culture and practices. Thus when a broadly Balkan-style Neolithic spread into central Europe, complex tell settlement and elaborate clay artefacts (pottery, figurines) gave way and a central-European-style Neolithic dominated by longhouses developed (Gronenborn and Dolukhanov, Chapter 10; cf. Last, Chapter 14; Coudart, Chapter 16). Equally, the subsequent and more divergent trajectories across north-western Europe developed their own character, often drawing on distinctive features of landscapes, environments, climates—and even indigenous communities—in that region (Thorpe, Chapter 11; cf. Brophy, Chapter 17, Larsson, Chapter 18). This section also outlines patterns of cultural change beyond Neolithic beginnings, particularly the widespread social changes of the late Neolithic or Copper Age. During this period there was, for example, significant regionalization in all aspects of cultural identity with often staggering levels of material diversity, whilst at the same time far-flung regions became connected in new ways as new sets of material became desirable.

Chapters in both sections bring home the significance of environmental factors and demography, for too long either presented as ‘deterministic’ or shunned because of that perception by many accounts of the past 40 years (see, e.g., Gronenborn 2005; Bocquet-Appel 2009; Vander Linden 2011). These issues require reappraisal in our accounts of Neolithization and subsequent developments. As a number of contributors demonstrate, to continue to ignore them is to

deny that early farming societies were susceptible to climatic fluctuations, the productivity of their crops and herds, and the ebb and flow of population numbers. This is forcefully expressed by Dolukhanov and Gronenborn ([Chapter 10](#)), who emphasize the significance of crises, directly or indirectly relating to major climatic events, in shaping the course of the Neolithic of central and eastern Europe. Yet even areas such as the Alpine lakes, where changes in climate could have marked impacts, were not settled or abandoned exclusively in response to environmental parameters (Menotti, [Chapter 15](#)), and the most satisfying explanations invoke multiple causes for social transformations (e.g. Guilaine, [Chapter 4](#), Malone, [Chapter 9](#)). Thus, contributors emphasize the importance of exploring the varied reactions of different communities to environmental events. Brown et al. ([Chapter 2](#)) outline how regionally differentiated, locally mediated, changing human–environment relations have an important part to play in our accounts, whilst Shennan ([Chapter 7](#)) stresses the potential of supplementing our meta-narratives of the Neolithic with local demographic histories. Müller ([Chapter 3](#)) goes one step further by modelling demographic developments and land use patterns around the tell of Okolište in Bosnia. These are offered as starting points for interpretation: it is essential to ask how different communities (consisting not just of human beings, but animals, plants, buildings, and artefacts—even materials and supernatural entities; see below) reacted to changes in environmental affordances, and how, in turn, their actions shaped their surroundings and altered their environments.

These sections of the volume also highlight how interpretations differ across Europe. One of the most apparent schisms in debate concerns the processes behind the spread of the Neolithic, and most notably the roles played by ‘indigenous’ communities and ‘migrating’ farmers. All the chapters in these initial sections deal with this to varying degrees. Especially in Britain, migration was rejected by large parts of the research community from the 1980s until recently, partly because the focus had shifted to regional and local analyses, partly because migration as the large-scale movement of people from one area to another was understood in simplistic terms, and partly because it was associated with culture-historical and processual approaches. In common with certain areas of northern Europe and the Baltic (Dolukhanov and Gronenborn, [Chapter 10](#)), the origins of the British Neolithic were seen in the adoption of farming by native hunters and gatherers. Some of these ideas were also applied to continental Europe (e.g. [Whittle 1996](#); [Kind 1998](#); cf. [Scharl 2004](#)), where they now have to contend with mounting evidence for large-scale migration, at least in the case of the early Neolithic of central Europe ([Brandt et al.](#)

2013). Migration has even made a much-needed, if occasionally polemical, comeback for Britain and other parts of north-western Europe (e.g., [Sheridan 2010](#), *inter alia*; [Rowley-Conwy 2011](#)), supported by recent scientific advances which demonstrate that most domesticated animal and plant species were introduced from elsewhere (Tresset, [Chapter 6](#)), most likely by migrants. Elsewhere, migration was never so wholeheartedly rejected, and its relevance to the Neolithization of south-eastern, central, and Mediterranean Europe is explored in this volume (Guilaine, [Chapter 4](#); Müller, [Chapter 3](#); Schier, [Chapter 5](#); Malone, [Chapter 9](#)), with considerable emphasis on the relative role of newcomers and indigenes. Researchers now see this as a complex process with differing kinds of constituent events, and are considering exactly when and how different overlapping processes of change occurred, as well as focusing on the historical events by which new media first appeared in any region (e.g. [Garrow and Sturt 2011](#); [Gronenborn and Petrasch 2010](#); [Whittle et al. 2011](#)). Monolithic and mono-causal explanations are giving way to nuanced local narratives in which specific episodes of activity are enmeshed with unfolding and cumulative processes of change at a wider scale.

The next step is to identify different scales and kinds of migration and other mechanisms of diffusion, from inter-marriage over several generations to, say, the movement of entire communities in one season. Processes of ‘internal colonization’—in which environments close to currently occupied ones, but different in character (such as wetlands or higher altitudes), are settled—can coincide with new material culture boundaries expressed as a proliferation of regional cultural groupings, for instance in the case of the later Neolithic of central Europe. These are interspersed with periods in which certain aspects of material culture—and perhaps identities—are shared over wide areas, and occasionally connected with an expansion event, for instance in the case of the third-millennium Yamnaya culture (Schier, [Chapter 5](#)). At other times, for instance with the Bell Beaker phenomenon (Vander Linden, [Chapter 31](#)) or Corded Ware groups (Schier, [Chapter 5](#)), migration may have involved few people but wide geographical areas and a substantial cultural impact, often in spheres of activity particularly visible to archaeologists, such as metalwork, pottery, and burial practice. In either case, neither migration nor adoption should be seen as easy answers: they are the beginnings of interpretation rather than its end point, with their scale, reasons, modalities, and local impacts still to be determined. The dynamics between migration, individual mobility, colonization, and cultural trajectories are hence once again among the more exciting research questions to pose.

As contributors to this first section make clear, essential to such a

debate is the importance of unpacking ‘Neolithization’ as complex and multi-stage across any one region. More specifically, it is evident that the ‘Wave of Advance’ model, and the following period of stability amongst agricultural communities, is a misleading oversimplification, as demonstrated by Müller ([Chapter 3](#)) and Guilaine ([Chapter 4](#)), who envisage a sequence of rapid expansion, stagnation, and renewed expansion following a period of cultural change for the arrival of the Neolithic in the Balkans and Mediterranean respectively. Similarly, Schier ([Chapter 5](#)) sees alternate episodes of very fast spread and stagnation across central and eastern Europe. In this way, the Neolithic unfolded in varied ways, with the consequence that demography, environment, and various socio-cultural factors will have been of varied significance in different scenarios.

Further work is still needed on how and why Neolithic practices and products spread, as well as on why they did not at other times, and new approaches are now emerging. For instance, the idea that Neolithic goods were ‘prestigious’ to neighbouring Mesolithic communities has long been popular. It may be that some forager or fisher communities were attracted to exchange with farming communities for various reasons, even travelling long distances for this purpose ([Thomas 2013, chapter 8](#)). Yet, as ([Rowley-Conwy 2014](#); [Layton and Rowley-Conwy 2013](#)) has pointed out, the understanding of Neolithic goods as prestigious to others relies on analogies with seventeenth to twentieth-century AD colonial contact with its material asymmetries that do not fit the slighter differences between European Neolithic and Mesolithic communities. For instance, interactions between Ertebølle and Linearbandkeramik (LBK) or Rössen communities during the millennium or more when they co-existed have been rethought recently ([Layton and Rowley-Conwy 2013](#); [Bogucki 2008](#); [Gronenborn 2009, 2010](#)). LBK and Rössen Neolithic communities acquired, adopted, or copied more elements of Mesolithic material culture than has been conventionally realized, including T-shaped antler axeheads, bone chisels, decorated bone ornaments, bows and arrows, microlithic tools, and in one case even a pointed-base pot. Whilst Neolithic communities may have treated some of these objects as prestigious (e.g. placing antler axeheads or decorated bone ornaments in burials at Brześć Kujawski—[Bogucki 2008, 55–58](#)), there is less evidence that Mesolithic communities understood Neolithic artefacts in this way, putting Danubian shafthole axes to the same uses as traditional local designs ([Rowley-Conwy, 2014](#)) and showing little interest in LBK or Rössen ceramics, whilst adopting pottery derived from hunter-fisher-gatherers to the north-east around 4600 BC. By and large these Mesolithic communities did not readily adopt agriculture, nor seemingly treat the artefacts of

Neolithic communities as special, forcing us to question the seductive idea that a desire for prestigious goods was the thin end of a wedge that led to the adoption of agriculture.

A further area of contention lies in how archaeologists identify prehistoric communities from material remains. The concept of archaeological cultures has been central to classifying the diversity of material culture and architecture, ways of living with and subsisting on plants and animals, ways of treating the dead, and so on, since the early twentieth century—and continues to be seen as significant in many parts of central, southern, and eastern Europe, as shown by many contributions to this volume. Elsewhere, the concept has been widely dismissed or at least strongly critiqued (e.g. [Winter 2009](#); [Gramsch and Sommer 2011](#)). The emerging consensus is that simplistic and universalizing equations of ‘archaeological culture’ with ethnic group are inappropriate, but that the coherence of some archaeological traits and assemblages nonetheless demands explanation—as does any strong coincidence of genetic markers with such archaeological cultures. Ethnicity is complex, and ideas about group identity may be framed in varying ways. In some cases, European Neolithic communities may have identified themselves with reference to biological, social, and/or mythic forms of ancestry. Generating traditions of artefacts and buildings that replicated ancestral things and structures might have been another important factor alongside or alternative to these forms of ancestry and identity. Group or ethnic identities might be more important at some times than others, more or less fluid, more or less shared and expansive, subject to sudden or gradual change—contextual analyses are needed to resolve these issues in each case.

Interpretations of cultures or societies are intimately connected with how we understand the constitution of past communities. People sharing material culture traits would not necessarily see themselves as forming a distinct community, and we must consider carefully how the production, use, circulation, and transmission of objects and practices can bring about various identities. In addition, traditional archaeological understandings of ‘culture’, ‘society’, and ‘community’ have been questioned, and the point made that such entities are composed of animals, plants, places, substances, and things, as well as human beings (e.g. [Fowler 2004](#), 95; [Harris 2014](#); [Webmoor 2007](#)). Hence, there is opportunity for revitalizing the study of the distributions of specific media, practices, and people, and the concept of ‘archaeological cultures’ may be a useful way to explore the emergence, effect, spread, mutation, and dissipation of inter-related and changing traditions of practice (cf. [Robb 2008](#)). For instance, Müller ([Chapter 3](#)) illustrates how economic, social, and ritual spheres

reacted quite differently during the late Neolithic of different areas, implying there was not ‘one’ social or cultural trajectory across south-east Europe, but a mosaic of development in which it is hard to draw clear boundaries. Equally significant here are the relations between different sections of society, such as the young or old, male or female, and those born into versus those marrying into a community. ‘Society’ is often tacitly envisaged as unitary and pulling in the same direction, yet this is merely an assumption, and multiple inter-woven societies—some denser than others, some larger-scale than others, some more rigid than others—based on various categories of identity and kinds of practices may have co-existed without forming a singular coherent whole. Social differences developed during the Neolithic, as is perhaps best illustrated in the late Neolithic or Copper Age, when there is an increasing emphasis on strictly demarcating gender in burial rites throughout the Balkans (Borić, [Chapter 49](#)), in the Corded Ware and Bell Beaker horizons (Schier, [Chapter 5](#); Vander Linden, [Chapter 31](#)), and in some Mediterranean traditions (Robb, [Chapter 50](#)); but the ways in which this was manifested and the degree to which it related to daily routines and differences in autonomy or efficacy in interpersonal relations may have varied. Social differentiation was probably widespread during the Neolithic, but it took many different forms and rarely coalesced into a single hierarchical arrangement.

NEOLITHIC WORLDS, NEOLITHIC LIVES (AND DEATHS)

One intention of the present volume was to grasp the breadth and diversity of evidence and interpretation by inviting as wide a range of scholars as possible to comment on major types of archaeological evidence for Neolithic daily life and worldviews. There are sections on *Houses, habitation, and community*; *Subsistence and social routine*; *Materiality and social relations*; *Monuments, rock art, and cosmology*; and *Death, bodies, and persons*. The aim of each is to demonstrate the spatial and chronological variability of the evidence and to explore its implications.

This part begins with a consideration of domestic space in *Houses, habitation, and community*. Sedentism, or settling down, has long been regarded as a defining feature of an agricultural way of life, although the two aspects did not necessarily always emerge together (Guilaine, [Chapter 4](#); Papaconstantinou, [Chapter 13](#)). Both between and within regions, there was great diversity in the extent to which permanent, long-lived buildings or settlements were created. Long-running research traditions in many areas have amassed a wealth of data on domestic architecture, which suggest that Neolithic people regularly

chose to live in larger, more permanent settlement agglomerations than ever before, their individual dwellings often impressive buildings. Elsewhere the evidence can often be less rich, reflecting the ephemeral nature of architecture as well as possibly more mobile inhabitation strategies, perhaps with a greater role for herding. This has long been argued for the Neolithic sequence in much of Britain (Brophy, [Chapter 17](#)), the beginning of the Neolithic in Spain (Papaconstantinou, [Chapter 13](#)), and in later phases of the Neolithic for parts of southern Scandinavia (Larsson, [Chapter 18](#)) and the Balkans (Raczky, [Chapter 12](#)). This distinction between house-rich and house-poor areas and phases is intriguing and remains a key focus of research (e.g. [Hofmann and Smyth 2013](#)). We still need to explain why houses (Last, [Chapter 14](#); Coudart, [Chapter 16](#)) and even settlements (e.g. in south-eastern Europe: Raczky, [Chapter 12](#)) were sometimes monumental but at other times slighter and less elaborate—and the extent to which these changes relate to other spheres of life, such as the creation and use of enclosures or other monuments, subsistence routines, or burial.

Houses were not only architecturally varied, but may have also been built for different reasons. In Britain (Brophy, [Chapter 17](#); Garrow, [Chapter 38](#)), the relative paucity of houses has often been cited in support of the uptake of the Neolithic by indigenous foragers, who remained more mobile. Substantial houses were perhaps too quickly labelled as having only ritual, ceremonial, or symbolic functions, such as the ‘halls’ current for a short period during the beginning of the Neolithic in southern Scotland ([Thomas 1996](#)). Restricting interpretation in this way risks under-appreciating diversity in Neolithic ways of life and inhabitation. Furthermore, dwellings may have left little or no subsoil traces, even if communities occupied the same locale for decades or repeatedly returned to the same place for generations. Both Brophy and Garrow paint a picture of diversity, from the ‘broad spectrum exploitation’ of wild and domestic foodstuffs evident in East Anglian pits to the caches of burnt cereals at Scottish timber halls. There was significant variability in occupation sites in the British Neolithic and in the scale and nature of mobility, and regional and chronological patterns are coming into ever-sharper focus.

Even where substantial houses were common in Neolithic Europe, individual structures could be relatively impermanent, being replaced once a generation in the LBK of central Europe (Last, [Chapter 14](#)) and on tells (Raczky, [Chapter 12](#)), and even more frequently in the Alpine foreland (Menotti, [Chapter 15](#)). Contributions in this section draw out the differing temporalities of house biographies alongside the longer-term patterns of change and continuity. The social and symbolic

importance of the house (e.g. Papaconstantinou, [Chapter 13](#); Last, [Chapter 14](#)) remains crucial in understanding both these recurrent rhythms and architectural transformations in the longer term. Coudart ([Chapter 16](#)) addresses this through the relationship between idealized ‘mental representations’ of houses and the relative speed with which the constituent elements of central European architecture changed, and her discussion grapples with the tension between architectural standardization and variation. These could well be related to variations in household composition and routine practice, themes explicitly addressed by Last ([Chapter 14](#)) and Menotti ([Chapter 15](#)). Yet even in contexts with exceptional preservation, such as the Alpine lake villages, these factors remain difficult to trace. Overall, much more remains to be written about the social implications of different styles of architecture and how they assisted in creating or maintaining certain kinds of communities and lifestyles.

Routines, whether associated with domestic spaces or out in the landscape, remain central for social reproduction and change, as discussed in [Subsistence and social routine](#). The requirements and tasks associated with plants and animals were central to Neolithic life and took up the bulk of people’s time. Although the Neolithic has been defined on the basis of the introduction of and reliance on domestic animals and crops, the extent to which this holds true is chronologically and regionally varied. ‘Agriculture’ could have been practised in many varied ways alongside other subsistence activities and as part of differing daily, seasonal, and annual routines, a point recently stressed in relation to the importance of garden-type cultivation in Neolithic societies (e.g. [Jones 2005](#)). Drawing on stable isotope analyses as well as more traditional forms of evidence, Schulting ([Chapter 19](#)) challenges the view that there was a gradual transition to a Neolithic lifestyle, as has long been argued for in north-west Europe, but points out that hunting, gathering, and fishing continued or made a resurgence during the Neolithic in some areas, such as the Netherlands and parts of Scandinavia (cf. Brown et al., [Chapter 2](#)). Bogaard and Halstead ([Chapter 20](#)) argue that we have spent too much energy focusing on the Mesolithic–Neolithic transition and on drawing up facile oppositions between hunting/gathering and farming/herding lifestyles. They explore the rich detail provided by faunal and palaeobotanical evidence in particular, identifying differential regional roles for activities such as gardening, hunting, and tending domesticated animals. In south-east and Mediterranean Europe, the transition to an intensive agricultural system was rapid and subsistence strategies were, at least initially, less varied than those related to social reproduction or settlement. This was also the case either side of a long-lasting chronological hiatus in the expansion

of farming across western and northern Europe (Rowley-Conwy and Legge, [Chapter 22](#)). Bartosiewicz and Lillie ([Chapter 21](#)) contrast eastern central Europe, which exhibits greater coherence in spite of some regional variation, and the much more diverse, gradual, and piecemeal adoption of farming in the Baltic and Ukraine.

These varying rates of adoption were not only due to environmental and climatic differences, but were also intimately connected to new socialities, social identities, and worldviews. These too would have affected daily routine. Taking a phenomenological perspective, Mlekuž ([Chapter 23](#)) connects the often repetitive rhythms of the seasonal round to the formation of identities by interlinking the biographies of people, gardens, and houses in south-eastern Europe. He also stresses the importance of harvests and festivals as potentially subversive episodes during an otherwise harmonious flow of interconnected activities (potentially also ritualized) throughout the year. Equally important points about the social and symbolic dimensions of human–animal relations are discussed later in the volume by Marciniak and Pollard ([Chapter 39](#)). Through feasting, their role in myths, or as wealth ‘on-the-hoof’ which needs to be cared for, animals were clearly critical factors in the biographies, identities, and routines of Neolithic people. Daily life was also punctuated by other concerns. Religious routine and pilgrimage is explored by Loveday for Britain ([Chapter 24](#)), where these concepts have a particularly long research pedigree associated with the study of earthen, wood, and stone monuments. Loveday associates specific beliefs and practices with particular monuments which were only built in certain landscapes in some periods of the Neolithic. His suggestion that pilgrimage was a key mechanism for the spread and distribution of certain types of monuments and practices once again brings connectivity across parts of the British Isles and continental Europe to the fore: all the more so if we place this contribution alongside the discussion of causewayed enclosures across northern Europe by Andersen ([Chapter 42](#)), or the evidence for related traditions of megalithic and non-megalithic chambered tombs discussed by Cummings et al. ([Chapter 43](#)).

New subsistence practices, social identities, and worldviews also meant new objects. The rejection of ‘archaeological cultures’ in some parts of Europe during the 1970s to 1990s arguably led to a neglect of the interpretive potential inherent in the close stylistic study of a variety of artefact types. Detailed appreciations of typologies of objects and architecture are crucial to exploring change: object ‘types’ are not merely archaeological descriptions but outline the key relationships constituting those things. Changes in artefact types do not only occur at period boundaries, although they may be more pronounced at such times, but repeatedly and unevenly through

periods. This theme, whilst taken up by earlier chapters, is the focus of the section entitled *Materiality and social relations*. Artefacts have often been used to define the onset of new periods—most notably pottery and polished stone tools for the Neolithic, and the first metal objects for the Copper Age. Yet chapters in this section transcend the formal description of such objects, focusing also on the complex relations and meanings with which their making, use, and deposition was imbued. This can take the form of biographical approaches which broadly link the life courses of things and people (e.g. chapters by Cooney, Pechtl, Chapman and Gaydarska, and Axelsson et al.). Comparing artefact biographies can draw out diversity in the use of superficially similar types of artefact. Flint daggers, for example, were seemingly prestige goods in some areas, but used for routine plant processing in others (De Grooth, [Chapter 25](#)). This cautions against a too simplistic identification of ‘high-status’ goods which have the same significance in all the regions in which they appear.

These complexities are traced by focusing on three sets of material—lithics, pottery, and a variety of ‘exotic’ items. Whilst lithics are employed in routine, everyday tasks, contributors here also stress their importance to the creation of social identities and their symbolic implications. The sourcing of materials is especially significant in this regard, be this through the technologically demanding mining of high-quality flint (Capote and Díaz-del-Rio, [Chapter 26](#)) or the careful selection of sources for stone axes (Cooney, [Chapter 27](#)). It may also be useful to think about different spheres of use and exchange, some more routine than others. Various artefacts, some the products of part-time specialists (De Grooth, [Chapter 25](#)), could circulate within and across these spheres in the course of their biographies, occasionally punctuated by rather formalized acts of deposition (e.g. Cooney, [Chapter 27](#)). We can also consider places of production as ‘special’, or even as monumental, as in the case of the flint mines (Capote and Díaz-del-Rio, [Chapter 26](#)), and such locations may have been connected with ancestral powers (Cooney, [Chapter 27](#)). Again, the movement of some axeheads, such as those of Alpine jadeite, across enormous distances underlines the degree of interconnectedness and mobility that was a key feature of Neolithic Europe (Pétrequin et al. 2012).

Whilst clay artefacts generally moved less far, the chains of activities connecting people and materials in the production of pottery were as significant as for stone tools. Pechtl ([Chapter 29](#)) and Petersen and Müller ([Chapter 30](#)) provide insights about the tasks associated with procuring and transforming materials during the production of pottery, the participants involved, the spread of potting techniques, styles, and decorative motifs, and the implications for understanding

social dynamics. It is also apparent that variations in size, shape, and decoration yield important information about the affordances and effects of vessels, particularly when combined with contextual information about deposition and analyses of fabric composition and food residues. Pechtl explores the implications of conservatism and innovation in ceramic design for understanding cultural identity among LBK communities, whilst Petersen and Müller discuss the use of ceramic vessels in both domestic and monumental contexts in northern Europe. Both contributions stress the restricted range of vessel forms present at the outset of the Neolithic in each region.

Despite the importance of fabric analyses, the sourcing of raw materials for pottery conventionally plays a secondary role compared to the shape and surface decoration of the finished piece. Traditional culture history has (sometimes unfairly) been criticized as equating these stylistic aspects with prehistoric ‘peoples’, a theme taken up in detail and with the use of new biomolecular techniques by Budja (Chapter 28), who investigates the relationship between pottery and population flows across south-east Europe. Similarly, Vander Linden’s (Chapter 31) discussion of Bell Beakers combines the archipelagic nature and local diversity of this phenomenon with the evidence for considerable individual mobility. Interestingly, in spite of some discussion about the use of differently-sized vessels for different social occasions (Pechtl, Chapter 29), there is still a division between studies of pottery, where routine practices and production processes have proven very fruitful avenues for research, and items such as figurines and miniatures, particularly frequent in south-east Europe (Nanoglou, Chapter 32) and traditionally discussed with reference to a ‘ritual’ sphere. Where available, figurines—through their degree of standardization, hybrid nature, use, and deposition—can provide productive avenues for the discussion of personhood and identity, but they need to be more consistently related to other aspects of Neolithic life to reveal their full interpretive potential. We still need to understand why these miniatures were a central and long-lived part of Neolithic life in some regions but rare or absent in many others; and their connections with routine activities and the everyday links between bodies and materials is an under-explored avenue in this context. Perhaps this could also shed light on the contrast between areas exhibiting representational art in enduring media like stone and those where representation was largely either avoided or reserved for ephemeral media (see Chapters 44–46 and Fowler and Scarre, Chapter 53; cf. Robin 2012).

The last set of chapters in this section is concerned with durable artefacts which were distributed over long distances—in some cases thousands of kilometres. Perhaps the best-known example is the

Mediterranean *Spondylus* shell, exchanged across central Europe and as far west as the English Channel. As Chapman and Gaydarska (Chapter 33) show, its use in different regions was bound up within changing local discourses of prestige and the exotic, providing yet another example of the way in which widely shared materials were enmeshed in a myriad of local concerns. In contrast to *Spondylus* shell, Baltic amber was collected and worn from Mesolithic times, but saw fundamental changes in manufacture and distribution in the Neolithic, with the quantities of amber deposited varying widely over time and space (Axelsson et al., Chapter 34). Like *Spondylus*, the restricted littoral distribution of amber made it a rare, exotic material inland, but its value, significance, and use changed through time and varied between regions.

The relationship between metal manufacture, specialization of production, and social differentiation is taken up in the contributions by Heyd and Walker, Bartelheim and Pearce, and Roberts and Frieman (Chapters 35–37). The earliest objects have long been regarded more or less exclusively as indicators of wealth and identity, but these contributions highlight the complex and varied relationships instrumental to the emergence and spread of early metallurgy. Heyd and Walker explore the geographical ebb and flow of metal supply and metallurgical activity across central and south-eastern Europe, emphasizing variations in the availability, value, and impact of early metal objects whilst stressing the complex chains of relations needed to produce these artefacts. Connections with other areas like the central and western Mediterranean were established and enhanced through trade in copper, but these were unstable. Bartelheim and Pearce consider how copper may not always have been regarded as valuable in the earliest period of its use across the western Mediterranean, and may have been available in greater amounts than previously thought, whilst Roberts and Frieman illustrate that whilst metal objects were often ‘eye-catching’ ornaments, they did not directly cause social transformation, nor in themselves consolidate any existing social differentiation in northern and western Europe. All these contributors highlight how much is still to be done in better understanding the relationship between the circulation and deposition of various categories of object. Taken together, they invoke a Neolithic world populated with a plethora of colourful and diverse things with a range of uses, properties, and effects, of which but a fraction of the most durable have survived.

As with all sections of the volume, the chapters in *Monuments, rock art, and cosmology* are necessarily selective given the enormous variety in Neolithic monumentality across Europe: the megalithic monuments of the Mediterranean, and from northern Europe cursus monuments,

stone alignments and henges are the most notable omissions. Nevertheless, a wide range of site types are represented. The contributors concerned with enclosures (Petrasch, [Chapter 40](#); Skeates, [Chapter 41](#); Andersen, [Chapter 42](#)) highlight the diversity in their shape, size, and use, which precludes a single function for such sites. Certain divisions are possible, for instance between continuous enclosures surrounding settlements, as in earlier fifth millennium Italy (Skeates, [Chapter 41](#)), or fourth millennium causewayed enclosures in northern and western Europe (Andersen, [Chapter 42](#)), which often form the focus for deliberate deposits of human remains and artefacts. Enclosures of both types exist in central Europe, where Petrasch ([Chapter 40](#)) draws out how fifth millennium roundel enclosures were oriented towards celestial events and along cardinal points, providing an *axis mundi*. In common with Hoskin's ([Chapter 48](#)) interpretation of passage graves across Europe, this suggests that celestial and particularly solar phenomena were a significant element to religious worship and practice across large areas.

The question of whether such monuments were 'central places', crucial in the creation of power relationships and of community identities, also applies to other kinds of site, such as the chambered cairns discussed by Cummings et al. ([Chapter 43](#)). Their wide-ranging geographical coverage, extending from Iberia to Britain and southern Scandinavia, enables the authors to draw out regional patterns alongside broad cosmologies. Building chambered tombs changed the nature of place and drew together materials from different locales and sources in producing new architectural effects. Indeed, a review of the chapters in this section, and related recent work (e.g. [Cummings 2012](#); [Noble 2006](#); [Scarre 2011](#)), suggests that the earliest Neolithic monuments in northern Europe were subtle translations of local places, integrated within cosmologies that may have identified specific places (and rocks and trees) as special. Subsequently, in each region of north-western Europe, monuments increasingly also exhibited a concern with celestial bodies, and arguably with the cosmos at a grand scale. Such monuments created new social relationships, but also became vital media through which people made sense of their world—from the changing tides (and sea levels) to flowing rivers and streams, from gradually opening vistas to the passages of the celestial bodies—and their place in it. As a result, they became places of renown that drew in pilgrims from afar, as suggested by Loveday ([Chapter 24](#)).

The importance of natural places and phenomena in the cosmology of Neolithic peoples is also illustrated by the contributions on rock art. One key research problem is the relationship between figurative and abstract rock art motifs, particularly in Iberia (Fairén-Jiménez,

Chapter 44), the Alps (Fossati, Chapter 45), or Scandinavia (Cochrane et al., Chapter 46). In Britain, rock art is exclusively abstract, and the glimpses of figuration in media such as carved chalk are predominantly of body parts rather than complete bodies (Fowler and Scarre, Chapter 53). As Cochrane et al. argue, the presence or absence of figuration may well indicate different prehistoric meanings and effects, and has arguably also caused some divergence in methodological approaches: the symbolic meaning of images is often stressed in areas with representational art, whilst the performative effects of engravings are brought to the fore where these are abstract. Rock art is also one of the ways in which the landscape is textured, and there are striking differences between, for instance, Britain, where smaller panels of art are often situated along routeways, and areas such as Valcamonica (Fossati, Chapter 45), which may have been centres for large gatherings revolving around the repeated production of rock art and stelae. As Fairén-Jiménez notes, open-air rock art in Iberia was densest and most complex at ‘natural corridors’ through the uplands. Skeates (Chapter 47), discussing the natural caves and artificial hypogea of the Mediterranean, underscores the variety of practices at these sites. His chapter also invites us to reconsider whether the distinction between ‘natural’ and artificially created spaces was important for their Neolithic users—much as in the case of monuments elsewhere in Europe, the merging of different kinds of site into a meshwork of powerful places and landscapes may be the more appropriate line of investigation.

Contributors to the final section on *Death, bodies, and persons* explore human bodies and personhood through mortuary evidence and bodily representations. As the authors are at pains to stress, these media can only provide a partial perspective, and need to be contextualized alongside the evidence for daily routines, the use of artefacts, and the inhabitation of space. As well as outlining both general trends and local diversity, most chapters in this section stress that archaeologically visible funerary rites are not representative of the whole population, and that a degree of selection must have taken place. The bases for such selection are seldom easily discernible, though factors may include age and/or sex, and in some cases these may reiterate or chime with older, Mesolithic, values (Borić, Chapter 49). Funerary rites may achieve many varied things, including idealized representations of identities or the material composition and connectedness of the community or individual—as explored in Borić’s account of burial in south-eastern Europe. Robb (Chapter 50) considers the importance of both local practices and their relation to broader episodes of change, exploring the importance of interaction at the larger scale. Thus, he analyses the impact of a convergence of new

mortuary practices and anthropomorphic decorated stelae during the third millennium, with neither sphere evidently intended to record individual biographies. Within such general trends, the standardization of burial varies widely across regions and periods, and the interpretation of such patterns remains a significant challenge.

In their contribution, Hofmann and Orschiedt ([Chapter 51](#)) draw particular attention to the changing significance of disarticulation in the central European sequence. Often marginalized as ‘deviant’ in previous accounts of the early Neolithic, the fragmentation of corpses at this time actually seems connected to shared ideas of personhood, whilst in the late Neolithic it is more likely reserved for outcasts. Variation also remains an interpretative challenge in southern Scandinavia (Sjögren, [Chapter 52](#)). There, early Neolithic mortuary practices were diverse and complex, but the deliberate disarticulation of human remains in chambered tombs may have been far rarer than archaeologists imagined in previous decades. By contrast, Sjögren warns, some late Neolithic ‘single graves’ actually show signs of the manipulation of the body after death. Hence, body treatment does not neatly correspond with the context in which the remains were placed, and this resonates with the review of evidence from Britain, Ireland, and northern France presented by Fowler and Scarre ([Chapter 53](#)). Placing emphasis on mortuary practices as transformations of the dead, Fowler and Scarre highlight a range of treatments, with bodies variously buried intact, cremated, or after a period of decay, and with a wide range of contexts used for their disposal. Whilst the monumental bodies of tombs endured in the landscape, human bodies were often shown to be ephemeral by contrast, albeit it in varied ways, and this is echoed in the lack of stone or ceramic anthropomorphic representations. As several of these chapters explore, bodies may have belonged to groups as much as, or more than, to individuals—and both depictions of bodies and their treatment after death may have formed an important arena through which the concerns of at least some of the community were brought to the fore. Each of the contributions in this section explores not only varying ways in which the dead were treated, but also varied reasons for, and effects of, those treatments.

LOOKING AHEAD

The volume highlights just how much has been achieved in our understanding of Neolithic Europe. Investigations have often been ambitious and open to new and radically different approaches—and the result is a diversity of interpretation and a wealth of debate. This

collection summarizes past traditions and current thinking, but crucially also provides a sense of the future direction of research that is exciting, productive, and sometimes unexpected (e.g. Whittle, [Chapter 54](#)). Throughout, contributions refer to issues and problems which can absorb future efforts, and it is clear that innovations in archaeological techniques and increasing opportunities for prehistorians to work outside their national traditions are opening up scales of study and research questions which hitherto would not have been possible. One important part of this is an increasing willingness to abandon interpretations which are exclusively rooted either in the grand narrative or the micro-scale, in the mono-causal or in singularly historic factors, and to challenge ingrained theoretical perspectives, whether those are implicit or explicit in prior research. Instead, there is an awareness that the integration of studies across scales, and combining different techniques, themes, and theoretical heritage, opens the door to thorough and insightful syntheses. In this sense, the volume is as much about the future of Neolithic studies as it is about its past.

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PART II

MOBILITY, CHANGE, AND INTERACTION AT THE LARGE SCALE

CHAPTER 2

ENVIRONMENTS AND LANDSCAPE CHANGE

TONY BROWN, GEOFF BAILEY, AND DAVE PASSMORE

ENVIRONMENTS, SCALE, AND AGENDAS 6500–2500 BC

THIS chapter considers the ‘environment’ between 6500–2500 BC, a period which encompasses most of what archaeologists have regarded as ‘Neolithic’ within Europe. This enormous stretch of time amounts to 40% of the Holocene sub-stage of the Pleistocene. At about 10.2 million km², Europe as defined here is also large, equivalent to 7% of the Earth’s landmass. It stretches over 35° of latitude and 50° of longitude and from just below sea level to 5633 m in altitude (Mt Elbrus in the Caucasus). Two implications follow; first, this chapter is necessarily an overview and highly selective, and secondly, ‘scale’ is itself an important issue when dealing with any idea of the European Neolithic.

The ‘scale’ problem becomes apparent when considering the record of climate change across Europe. Europe has today a wide variety of local climates ranging from the Arctic-Alpine to the semi-desert. The only climates (*sensu* the Köppen climatic classification) it does not have are the sub-polar continental, hyper-arid, and monsoon-dominated wet tropical climates. Local climates are determined by latitude, continentality (effectively longitude), and altitude. This can be illustrated by the variety of local winds which affect the countries bordering the Mediterranean alone (Fig. 2.1). It is, however, possible to identify common forcing conditions (pattern of global pressures and temperatures) for this region due to the underlying importance of the Westerlies and therefore conditions over the north Atlantic. So, for example, even the Mediterranean parts of Europe are under the influence of westerly cyclonic tracks for the delivery of precipitation. The extent to which these air masses penetrate into Europe is controlled through blocking by eastern high pressure systems. The Azores High and North Atlantic High also affect the path of these Westerlies over Europe and this control has been associated with differential climate change in northern and southern Europe. From

these synoptic constraints it is apparent that the Holocene climate of Europe would have been closely related to fluctuations in the North Atlantic Oscillation (NAO) index and to both El Nino–Southern Oscillation (ENSO) and the thermohaline circulation (THC), and through these ultimately to global factors such as variations in solar output (so-called sub-Milankovitch forcing) and astronomically forced variations in solar influx (Milankovitch forcing). However, the European landmass is characterized by small-medium altitude mountain ranges especially at about 42°–47° of latitude (Picos de Europe, Pyrenees, Alps, Apennines, Carpathians) which create strong orographic (topographic relief induced) patterning including rain-shadows and local winds, both now and in the past.

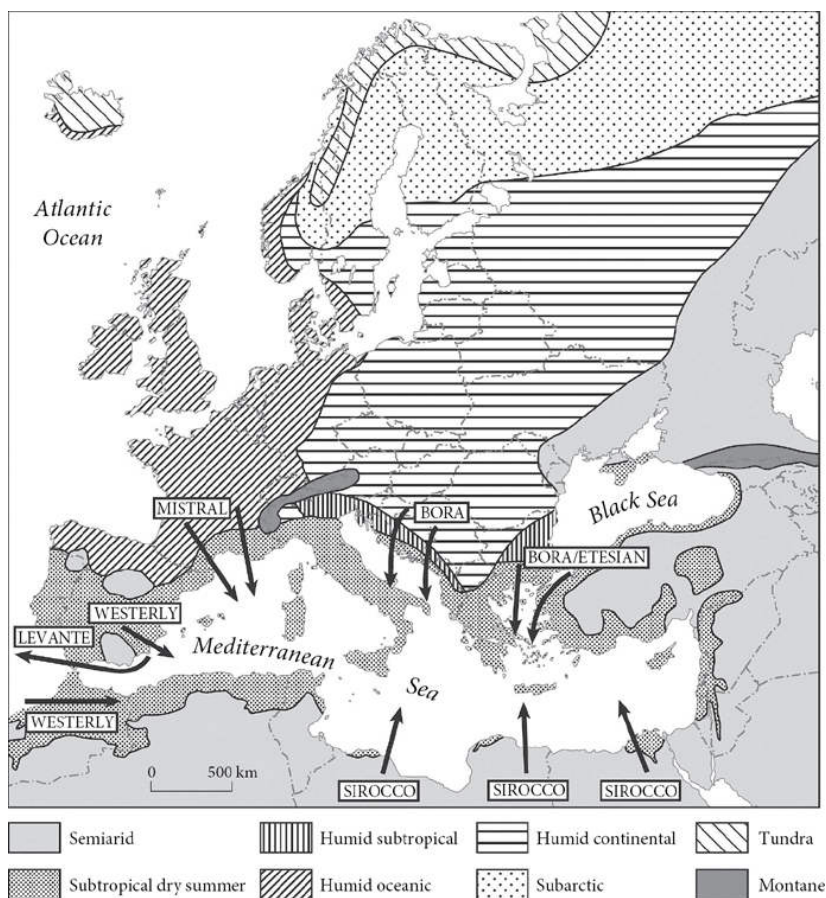


FIG. 2.1. The present climates of Europe with local Mediterranean winds derived from a variety of sources.

NEOLITHIC EUROPEAN CLIMATES FROM LAKES AND

Over the past 20 years there has been an explosion of research into Holocene climatic change, driven by the need to test global and regional climate models and by the prevailing ideological belief that climate change is the greatest scientific challenge of the present age. Within Europe, appropriate geochemical and biological climate proxies covering this period can be derived from lake sediments, raised mires, and alluvial sequences. Probably the most comprehensive source of palaeoclimatic data is the lake level record, which covers both southern and northern Europe. Within the Global Lake Level Database there are over 700 records from Europe (Prentice et al. 1996) which have been used by the BIOME 6000 project to map vegetation patterns. The Alpine region, being in the centre of Europe, is probably the most valuable. One of the most comprehensive data sets is provided by 26 lakes in the Jura Mountains (Magny 2004), from which 15 phases of higher lake levels were identified, four within the Neolithic (Table 2.1). In a more recent study of Lake Le Bourget in France, Arnaud et al. (2005) have correlated the lake level record with at least three periods of flooding by the Rhone, suggesting that this record is applicable for the entire western Alps region. Studies of lake levels in southern Europe are less common but several crater lakes in Italy have produced long sequences, such as Lago Grande di Monticchio, which shows rather subdued Lateglacial interstadials and Younger Dryas with relative climatic stability in the early Holocene (Allen et al. 2002). This is in contrast to northern Africa where there is abundant evidence of wetter conditions well into the Neolithic (Roberts 1998).

Table 2.1 Climatic shifts (dry in *italics*, wet in **bold) during the Neolithic identified from mire and lake records in Europe.**

Sites	Dates BP	Data	Postulated cause	References
Temple Hill Moss, Scotland	6850 6650 6350 5850 5300 4850	plant macrofossils and testate amoebae	millennial scale climatic periodicities	Langdon et al. 2003
Walton Moss, northern England	7700–6700 c. 5300	plant macrofossils	millennial scale climatic periodicities	Hughes et al. 2000, Barber 2007
Bolton Fell Moss, northern England and Abbeynockmoy, Scotland	c. 4400–4000	plant macrofossils	solar forcing	Barber et al. 2003
Mallachie Moss, Scotland	4450 4650	plant macrofossils	wetter climate	Langdon and Barber 2005
Lille Vildmose, Jutland, Denmark and Butterburn Flow, northern England	c. 4150	wiggle-match AMS dating of plant macrofossils and testate amoebae	decline in solar activity	Mauquoy et al. 2008
Jura, France (26 lakes)	8300–8050 7550–7250 6350–5900 4850–4800	sedimentological phases dated by 14C, tree-rings, and archaeology	solar activity	Magny et al. 2004

One climatic event during the early Neolithic that has received attention is the so-called 8.2 ka event. Analyses of seasonally laminated varved sediments from Holzmaar in southern Germany provide evidence of differences in duration and onset time of changes in summer temperature and winter rainfall during this event ([Prasad et al. 2009](#)). The data show that the onset and termination of the summer cooling occurred within a year, and that summer rains were reduced or absent during the investigated period. The onset of cooler summers preceded the onset of winter dryness by c. 28 years and statistical analysis of the varves indicates that the longer NAO cycles, linked to changes in the north Atlantic sea-surface temperatures, were more frequent during the drier periods. This suggests that the event is likely to have been associated with perturbation of the north Atlantic sea surface temperatures. This work is helpful in that it helps us define the magnitude of climatic perturbations which could have affected some early Neolithic communities.

Climatic reconstruction from bog surface wetness (BSW) has the advantage of more reliable and higher resolution dating than can be achieved for most lakes. However, it depends upon the continuous or semi-continuous growth of raised rain fed (ombrogenous) mires ([Barber 2006](#)), restricting its application to northern Scandinavia, European Russia, the western seaboard as far south as the southern English lowlands, or mountainous ‘outlier’ regions as far south as

north-west Spain (Cortizas et al. 2002) and mount Troodos in Cyprus (Ioannidou et al. 2008). Most raised mires start as lakes and in the early Holocene become groundwater-fed fens, at some point—most commonly sometime in the Neolithic—going through a fen-bog transition. This means that the number of BSW curves for the Neolithic is restricted temporally and geographically. This work has its origins in the climatic stratigraphy of mires used to formulate the Blytt-Sernander climatic scheme (Sub-Boreal to Sub-Atlantic covering the Neolithic and Bronze Ages) and the overturning of the autogenic theory of bog-regeneration by Barber in 1981 provided the stimulus for many studies of increasingly higher temporal resolution (Charman et al. 2007). The method of using macrofossils of *Sphagnum* spp. and peat humification has been applied in environmental transects (Barber et al. 2000) and combined with other proxies such as pollen, testate amoebae (Hendon and Charman 1997; Charman et al. 1999), and most recently $\delta^{18}\text{O}$ and δD from plant macrofossils (Brenninkmeijer et al. 1982; Barber 2006). Temporal resolution has been improved by both wiggle-matching and the use of *in situ* tephra deposits (Mauquoy et al. 2004; Plunkett 2006) and at the best sites a decadal resolution is claimed (Mauquoy et al. 2008) which is as fine, if not finer, than the dating of most archaeological sites within the Neolithic.

One reason for generally trusting these climatic reconstructions is the correlation between them and a vast array of other proxies, including later written records from the post-Roman period. Well known historical climatic ‘events’ often derived from soft data, such as the late Medieval climatic deterioration (Lamb 1977), the Medieval Warm Period, and the Little Ice Age, are also clearly shown in the mire-derived data sets (Barber 1981). For the prehistoric period BSW data has been correlated with a variety of both global and regional proxies, including the European lake level record (Magny et al. 2004), ice drift records from the north Atlantic (Bond et al. 2001), and ocean core proxies for the North Atlantic Deep Water (NADW) circulation (Chapman and Shackleton 2000). In terms of the causal mechanism, most interest has focused on solar events (van Geel et al. 1996; Mauquoy et al. 2004). However, no such solar episodes have so far been identified in the Neolithic and it is likely that solar activity was moderated or overwhelmed by other factors, particularly ocean circulation, especially in the western European seaboard. Most studies have shown a statistical climatic periodicity in the mid-late Holocene (Aaby 1976; Langdon et al. 2003; Blundell and Barber 2005; Swindles et al. 2007) with values of 200 years (Chambers and Blackford 2001; Plunkett, 2006), 265 and 373–423 years (Swindles et al. 2007), 550 years (Hughes et al. 2000), 560 years (Blundell and Barber 2005), 580 years (Swindles et al. 2007), 600 years (Hughes et al. 2000), and

1,100 years (Langdon et al. 2003). These can be compared with periodicities in other proxy data such as 210, 400, 512 and 550, 1,000, and 1,600 years in tree rings and ocean core-data (Chapman and Shackleton 2000; Rosproy et al. 2001). Although most of the records used in these studies start around the end of the Neolithic or in the Bronze Age (e.g. Charman et al. 2006), it is highly unlikely that these quasi-rhythmic climatic fluctuations started at this time. They probably started prior to the Neolithic in the early Holocene during the re-arrangement of the northern hemispheric circulation system following deglaciation.

Traditionally the Neolithic has been regarded as a period of relative climatic stability dominated by the Holocene thermal optimum at c. 7500 BP, when temperatures were 1–2°C warmer than today (Davis et al. 2003), and then a climatic deterioration c. 6500 BP (Karlen and Larsson 2007). In the original Blytt-Sernander climatic sub-division of the Holocene the Neolithic spans the later part of the Boreal (10500–7800 BP), the Atlantic (7800–5700 BP), and the early part of the Sub-Boreal (5700–2600 BP). The Boreal Atlantic boundary was largely based on a ‘recurrence’ surface or *Grenzhorizont* (layers of sudden change in peat humification caused by a change in climate) common in Swedish bogs (Barber 1981), whilst the climatic optimum was based upon biostratigraphic data such as thermophilous (warm adapted) vegetation in northern Europe and the occurrence of the pond tortoise (*Emys orbicularis*) outside its present-day breeding range (Stuart 1979). Another classical indicator of the mid-Holocene thermal optimum is high rates of ambient-temperature carbonate or tufa (calcareous spring deposits) deposition (Goudie et al. 1993). Although tufas continue to be deposited outside the mid-Holocene (Baker and Sims 1998), their occurrence is reduced. Tufas can also provide stable isotopic temperature records from a wide range of terrestrial and lacustrine sources throughout Europe, as well as through inferences from floral and faunal remains (Ford and Pedley 1996; Gedda 2006; Davies et al. 2006). Both of these thermal indicators are rather complicated but not invalid, and the concept of the thermal optimum remains valid, although the record of raised mires shows relative BSW stability during the Neolithic at least for north-west Europe. For example, only a few mires such as Temple Hill Moss and Walton Moss show short-lived wet phases (Langdon et al. 2003), (Fig. 2.2). Local variability is shown by the state of Scottish mires before, during, and after the deposition of the Hekla-4 tephra at 2310 ± 20 BC (Langdon and Barber 2004). In the absence of definitive Europe-wide studies of BSW in the sixth millennium BC, it is probably safest to assume a relatively gradual shift to the cooler and wetter conditions during the late Neolithic.

Table 2.2 Major volcanic events in the European Neolithic and some published dated tephras. Data from the tephra base (Newton et al. 2007) and other sources.

Eruptive source	Name/ Location recorded from	Date	Reference
Southern Italy; Campi Flegrei caldera	Agnano Monte Spina Tephra (AMST)	4690–4300BP	Blockley et al. 2008
Central Anatolian Volcanic Province (CAVP)	Eski Acigol	10 tephra layers between 14,300/11,300 and 8150/5000 years BP	Kuzucuoglu et al. 1998
Iceland	Hekla-4	2350–2250 bc	Pilcher et al. 1996
Iceland	Hekla-5	c. 6800 BP (5050 bc)	Smithsonian Institution's Global Volcanism Program (GVP)
Iceland	Hoy Tephra, Keith's Peat Bank	5560±90 ¹⁴ C years BP	Dugmore et al. 1995
Iceland	Lairg tephra A, Sluggan Bog, northern Ireland	6036±20 ¹⁴ C years BP	Pilcher et al. 1996
Iceland	Lairg tephra B, Sluggan Bog, northern Ireland	5811±20 ¹⁴ C years BP	Pilcher et al. 1996
Iceland	Mjauvotn A & B, Eidi, Faroe Isles	5910±45 ¹⁴ C years BP	Wastegard et al. 2001

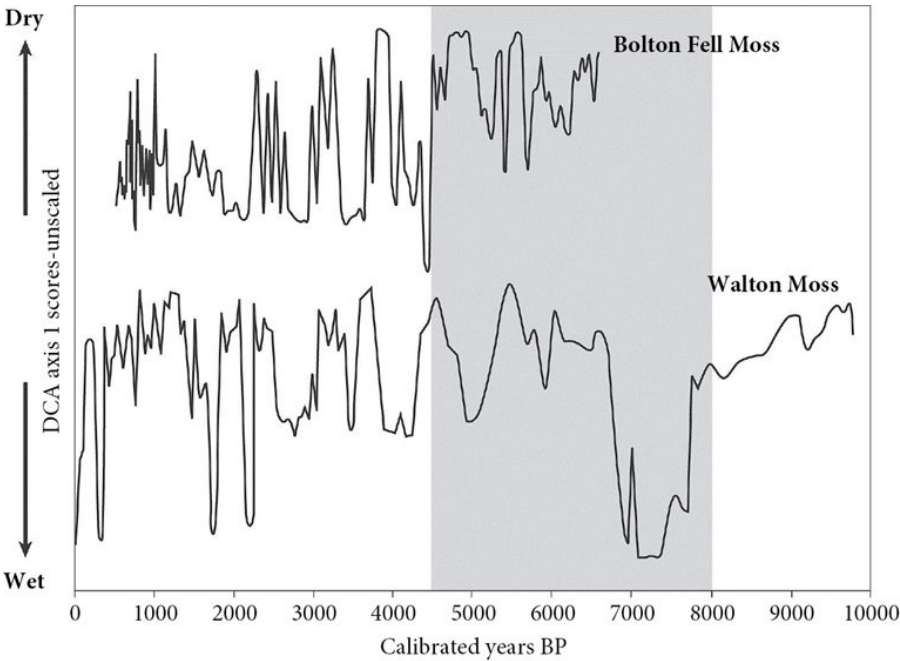


FIG. 2.2. Proxy climatic reconstruction from two raised mires in the UK.

At the end of the Neolithic, one of the most significant shifts in the climate of Europe occurs. The '4.2 Ka event' has been identified from a number of proxies including the ocean and ice cores ([Bond et al. 1997](#); [Brown 2008](#)), from a severe drought event in eastern Africa, and from increased sand movement in coastal dune systems along the eastern Atlantic coast ([Gilbertson et al. 1999](#); [Knight and Burningham, 2011](#)). In the British Isles it has been identified as a cool/wet phase from the BSW record of a number of sites in northern England ([Chiverrell 2001](#); [Charman et al. 2006](#); [Barber and Langdon 2007](#)) and Scotland ([Langdon and Barber 2005](#)), and from combined BSW and chironomid data from Talkin Tarn in northern England ([Barber and Langdon 2007](#)).

This climatic chronology will probably be further refined in the next few years with the increasing use of tephra layers, but the broad pattern is unlikely to change. A problem is what these shifts mean in climatic terms and how these bog-proxies relate to other hydroclimatic variables. As [Barber \(2006\)](#) has emphasized, the BSW proxy is a composite measure of past climate, principally because a change to a more continental climatic regime is likely to alter the relative importance of precipitation and temperature. Even for the present oceanic climate of north-west Europe, there is a correlation between temperature and precipitation at least at the mean annual scale ([Barber 2006](#)). At the annual scale the linking factor is the correlation between summer precipitation and the winter NAO index ([Kettlewell et al. 2003](#)), which is also correlated strongly with changes in mean annual temperature, and on the longer term the THC. Given these complications it is best to regard the BSW record as principally a response to north Atlantic sea surface temperatures transmitted through prevailing synoptic regimes and the resultant summer water deficit. Perhaps more attention should be paid to the dry shifts, which may also have significant, if not greater, archaeological implications.

Two other palaeoclimatic techniques, probably more closely related to variations in precipitation and applicable to the Neolithic, are speleothem (stalagmites, stalagmites, flowstones) luminescence and stable isotope studies. Due to its geological history, Europe is especially rich in limestone cavern systems and speleothem/tufa/travertine deposits. Long-term variations in the intensity of the luminescence under UV light of the growth bands within a speleothem can be related to climate and especially precipitation ([Baker et al. 1999](#)), although it is also sensitive to local vegetation change ([Baldini et al. 2005](#)). Using data from both mires and speleothems from Sutherland in north-west Scotland, [Charman et al. \(2001\)](#) have shown a correlation between peat humification, speleothem luminescence

emission wavelength, and ice-sheet accumulation. The use of speleothems has further potential to produce regional data in areas lacking ombrotrophic mires such as south-west England, north-west Scotland, northern Norway (Lauritzen and Lundberg 1999; McDermott et al. 2001), and southern Europe. Due to the frequent occurrence of annual luminescence laminae this technique has high potential to record annual climatic data, although so far most studies have focused on the short-term fluctuations in climate recorded over the last one to two millennia (Jackson et al. 2008).

MAPPING NEOLITHIC VEGETATION CHANGE

Many of the lake studies have produced direct evidence of vegetation from pollen and plant macrofossils. During the Late Glacial Maximum (LGM) most of Europe was dominated by *Artemisia* (mugwort) and *Chenopodiaceae* (goosefoot) steppe, but many refugia existed: evergreen oak (*Quercus ilex*) type woodland survived in Sierra Nevada; Atlantic cedar (*Cedrus atlantica*) and pistachio (*Pistacia* spp) existed in the Apennines and Balkans; and oak, pistachio, and olive survived together in the Levant (van Zeist and Bottema 1991) suggesting recolonization of Europe from the east. Herb-steppe was replaced in the early Holocene by sub-humid forest sometimes dominated by conifers but more typically by broad-leaved deciduous trees. The xeric (drought tolerant) evergreen forests, shrub, and heathland now typical of the Mediterranean part of Europe are rarely represented in early Holocene pollen diagrams. Attempts to map the Neolithic vegetation of Europe have produced a vegetation pattern closely resembling the climatic pattern shown in Fig. 2.1, but this uniformity is rather misleading since biogeographical, topographic, and edaphic factors pattern vegetation at the regional and sub-regional scale (Skinner and Brown 1999). The composition of the mixed deciduous forest varied from north to south. Oak-birch-hazel dominate its northern limits, lime-oak-hazel the south, and oak (deciduous and evergreen)-hazel-hornbeam the southern fringes. Similarly, the structure of these forests, including the occurrence of natural clearings and openings, reflected the spatially variable disturbance regime, including factors like wind-throw, animal activity (particularly beaver), disease, and snowfall. Indeed, the most well-known Holocene vegetation event in northern Europe, the 'elm decline' of around 5300 BP, is now commonly regarded as being due to disease and progressive forest clearance by Neolithic farmers. These allowed the beetle vector, *Scolytus scolytus*, to spread, transforming local outbreaks into a pandemic (Clark and Edwards 2004; Edwards 2004). It is also clear

that Neolithic woodland was not stable, with increasing evidence of mid-Neolithic woodland regeneration in England (Brown 1999), Scotland (Tipping 1995, 2010, 2012), and Ireland (O'Connell and Molloy 2001). At present it is not clear if this was due to declining fertility, agricultural decline, or climatic perturbations, but all these hypotheses are testable. There is also pollen, charcoal, and phytolith evidence of middle Neolithic woodland management, or so-called agro-sylvo-pastoral systems along the middle Rhone Valley (Delhorn et al. 2009). This evidence is clearly of relevance to our views of the mobile or semi-sedentary nature of early Neolithic farmers (Bogaard 2002, 2004), population densities, and their connections to the land and with other groups (Edmonds 1999).

LAKE AND WETLAND SETTLEMENT

One of the most climatically sensitive aspects of the archaeological record is lake and wetland settlement, which, due to high precision dendrochronology dating and good preservation of organic remains (seeds and animal bones), has great potential for investigating the impact of short climatic fluctuations on Neolithic economies and societies. Studies of lakes in the Alpine foreland have shown a remarkable correlation between climate proxies such as the ^{14}C calibration curve and palaeoeconomic data, suggesting that during phases of wet-cold climate wild resources like game were more intensively exploited (Schibler et al. 1997; Hüster-Plogmann et al. 1999; Arbogast et al. 2006; Schibler and Jacomet 2009). Whether this is a result of decreased cereal yields or some other cause is as yet unknown. Even more archaeologically important is that there is *no correlation* between these phases and 'cultures' as defined using pottery (Fig. 2.3). This suggests a disconnection between changes in material culture and changes in food procurement.

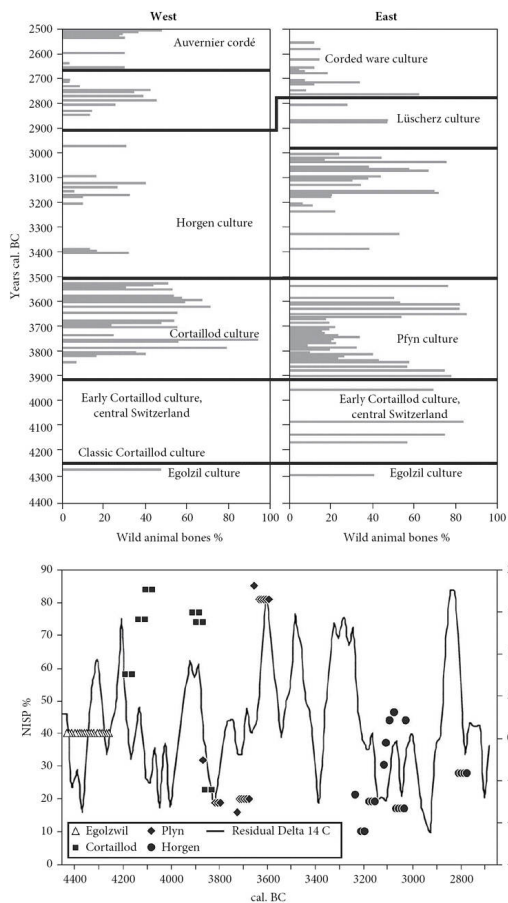


FIG. 2.3. Dendrochronologically dated wild animal bone frequencies and cultures from eastern and western Swiss Neolithic lake villages.

Adapted from Schibler (unpublished) by permission.

CATCHMENTS, VALLEYS, SEDIMENTS, AND SETTLEMENT

European river valley environments span a vast range of topographic and altitudinal settings, encompassing glaciated alpine mountain torrents, terraced river corridors, and extensive low-relief alluvial and estuarine settings on the coastal fringe. Neolithic communities were present in many of these settings, becoming well established in estuarine environments (see below) and extending into relatively high elevation upland localities. Indeed, palynological studies suggest that localized cereal cultivation was occurring from early Neolithic times at altitudes of up to nearly 2,000m above sea level in the alpine valleys of France (Argant et al. 2006; Martin et al. 2008), Switzerland (Welten 1977), and Italy (Pini 2002). In general, however, it is the

valley floors in the middle and lower reaches of European river systems that were especially important for Neolithic settlement, offering well-defined and frequently navigable routeways. The Danube and Rhine systems were particularly influential in the dispersal of Neolithic culture across Europe (Roberts 1998; Dolukhanov and Shukurov 2004; Davison et al. 2006). River valleys also offered ready access to freshwater, a rich array of resources, and in many cases low-relief, free-draining Pleistocene river terraces relatively free from flood-risk. Archaeological evidence of Neolithic settlement and especially ritual activities are widely documented on Pleistocene terrace surfaces, for example in valleys of the Trent catchment in the English Midlands (Knight and Howard 2004; Brown 2009a, 2009b), the middle Rhone valley in France (Beeching et al. 2000; Delhon et al. 2009), the Upper Odra basin in Poland (Zygmunt 2009), the Chienti basin in Italy (Farabollini et al. 2009), and the well-known site of Lepenski Vir on the Danube in Serbia (Borić 2002). In both northern and southern England, early Neolithic settlement was apparently initiated from river valley floors and estuarine and coastal lowlands, before late Neolithic and early Bronze Age expansion on to higher elevations and upland terrain hitherto unoccupied or utilized for subsistence activities (e.g. Thomas 1999; Waddington 1999; Garrow 2007; Passmore and Waddington 2012). As well as proving attractive for settlement, fertile and well-drained soils developed on Pleistocene sand and gravel terraces and low-relief catchments developed on loessic plains were favourable localities for pioneering early Neolithic agriculture (which is hence rarely detected on regional-scale pollen diagrams derived from upland peats; cf. Brown 1997, 2008). Although Mesolithic communities are widely thought to have manipulated the early Holocene woodland cover (Brown 1997), the early-mid Holocene temperate forests of Europe seemingly experienced little or no detectable soil erosion (e.g. Bork et al. 1998; Seidel and Mackel 2007). The arrival of Neolithic agricultural systems, embracing both domesticated livestock and arable cultivation, introduced a deliberate process of woodland management, clearance, and tillage that lowered landscape erosion thresholds, thereby creating the first significant possibility of impacting on river catchment sediment and hydrological systems.

The considerable interest in exploring the geomorphological impact of early farming is therefore not surprising. The impact of land-use changes on geomorphological activity in valley systems may be reflected in a variety of contexts, including hillslope erosion and gully development, sedimentation in colluvial and alluvial settings, river channel incision, and elevated water tables (Foulds and Macklin 2009; Fuchs et al. 2010). However, our ability to detect Neolithic land-use

activities in the landform and sediment archive of river valleys faces several challenges. These include the often fragmentary preservation (or removal) of sedimentary archives by later erosion, difficulties in establishing accurate chronological controls, and the potential for complex and possibly multiple phases of sediment erosion, transfer, and storage occurring downslope/downvalley of landscapes hosting Neolithic activities (e.g. [Lewin and Macklin 2003](#); [Houben et al. 2006](#); [Brown et al. 2009](#)).

These difficulties are perhaps most readily addressed in relatively small catchments or sub-catchments, where archaeological and palaeoenvironmental records can be compared to landform and sediment archives in the immediate vicinity ([Hoffmann et al. 2007](#)), and where the potential for intermediate sediment storage and reworking is greatly reduced. Such studies have reported evidence of late Neolithic valley colluviation, as well as alluvial fan and (or) floodplain alluviation linked to the onset of deforestation and localized arable cultivation for localities in Britain (e.g. [Brown and Barber 1985](#); [Evans et al. 1993](#); [Bell 1983](#); [French et al. 1992](#); [Collins et al. 2006](#); see also review by [Macklin 1999](#)), western France ([Macaire et al. 2006](#)), loess-covered valleys in southern Germany (e.g. [Kalis et al. 2003](#); [Lang 2003](#); [Hoffmann et al. 2007](#); [Fuchs et al. 2010](#)), and Poland ([Klimek 2003](#)). Neolithic catchment disturbance has also been inferred from accelerated rates of inorganic sediment accumulation in some lake sediment records, including sites in Britain and Ireland ([Pennington 1978](#); [Edwards and Whittington 2001](#)), Germany ([Zolitschka 1998](#)), and the French Massif Central ([Macaire et al. 2010](#)).

A broader perspective on Neolithic interactions with river environments may be obtained from countrywide reviews and comparisons of Holocene valley floor development throughout Britain ([Johnstone et al. 2006](#); [Lewin et al. 2005](#); [Macklin et al. 2006, 2009](#); [Brown et al. 2013](#)), Spain ([Thorndycraft and Benito 2006](#)), Poland ([Starkel et al. 2006](#)), Germany ([Hoffmann et al. 2008](#); [Fuchs et al. 2010](#)), and France ([Arnaud-Fassetta et al. 2010](#)) ([Fig. 2.4](#)). By exploiting the growing number of published and well-dated catchment landform and sediment records and adopting an increasingly robust approach to selecting, interpreting, and analysing ^{14}C -dated colluvial and alluvial sequences (cf. [Johnstone et al. 2006](#); [Macklin et al. 2009](#)), these studies indicate that the geomorphological impact of anthropogenic land-use change is seldom widely evident until the marked intensification of woodland clearance and agricultural activity from the Bronze Age and later periods. Rather, Neolithic channel and floodplain environments experienced relatively little direct human intervention, often maintaining a cover of alder-dominated woodland

and wetland habitats (e.g. [Knight and Howard 2004](#); [Tipping 1998](#); [Thorndycraft and Benito 2006](#)) amidst meandering (e.g. [Starkel 2002](#); [Dambeck and Thiemeyer 2002](#)) or anastomosing ([Knight and Howard 2004](#); [Brown 2008](#)) channel systems.

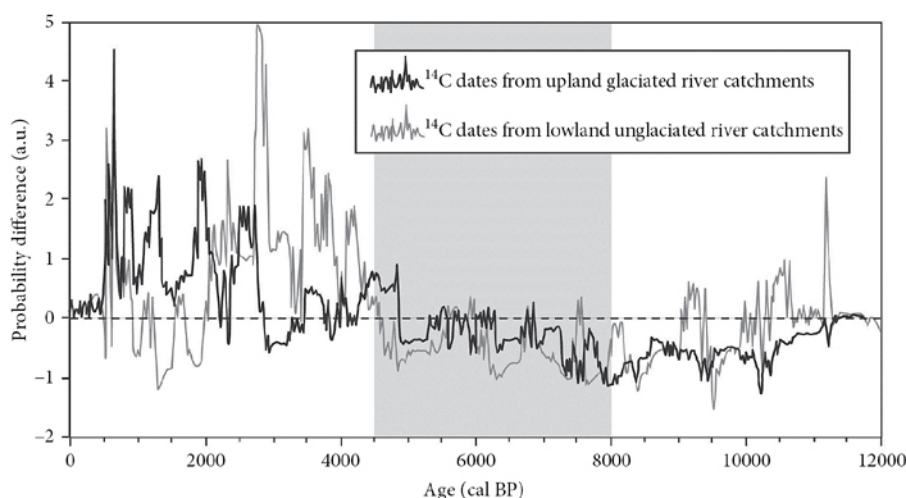


FIG. 2.4. The probability density function of alluvial radiocarbon dates for upland and lowland river catchments in Great Britain during the Neolithic.

Adapted from [Johnstone et al. \(2006\)](#).

However, countrywide and sub-continental scales of analysis show periods in the early–mid Holocene which experienced broadly synchronous phases of accelerated fluvial activity, and which have been linked to the emerging record of periodic shifts to a cooler and/or wetter climate ([Figs 2.2 and 2.4](#)). [Macklin and Lewin's \(2008\)](#) synthesis of the British, Spanish, and Polish records identified four such phases in the Neolithic, centred on 7590 BP (Spain, Poland), 6790–6820 BP (Britain, Poland), 5540–5640 BP (Britain, Spain), and 4840–4860 BP (Britain, Spain, Poland). Enhanced Neolithic flooding was also evident in Poland at 8400, 6250, and 5920 BP, and in Britain at 4520 BP. In German parts of the Rhine, Danube, Weser, and Elbe catchments, [Hoffmann et al. \(2008\)](#) also found broadly corresponding phases of accelerated Neolithic activity centred on 7475 and 5640 BP respectively. An additional early Neolithic activity phase at 8200 BP appeared largely confined to colluvial systems in smaller catchments. The 8.2k event is also evident in French catchments as a period of enhanced frequency and/or magnitude of flooding in the middle Loire, and as increased fluvial activity in the Durant and southern Alps; a similar pattern of activity occurs c. 6300 BP, although the record from the southern Alps suggests valley floors here were incising at this time ([Arnaud-Fassetta et al. 2010](#) and references therein).

Both Hoffmann et al. (2008) and Arnaud-Fassetta et al. (2010) found Holocene fluvial activity phases in German and French valley floors, respectively, to show only limited correlation with those identified by Macklin and Lewin (2008) in British, Spanish, and Polish records. This is considered to reflect, at least in part, differing approaches to the classification of ^{14}C dates and the analysis of frequency distributions, but for Arnaud-Fassetta et al. (2010) this contrast in the intensity of fluvial activity between mid-latitude European rivers and those in northern and southern Europe hints at a sub-continental tripartite division of European hydrosystems during the early–mid Holocene.

Current research agendas focusing on multiple scales of analysis (both spatial and temporal) and the quantitative modelling of fluvial system response to environmental change will refine our understanding of these issues (e.g. Arnaud-Fassetta et al. 2010; Hoffmann et al. 2010). What is clear from current evidence is that Neolithic land-use activities were rarely sufficient to promote detectable changes to channel and floodplain environments in the middle and lower reaches of larger European catchments. However, Neolithic communities were accustomed to flood hazard and the inherent rhythms of river channel adjustments, especially with respect to meander migration and occasional channel cut-off. During phases of cooler and/or wetter climate they also witnessed a change in the frequency and magnitude of flooding, alongside a change in the rate and possibly the style of channel and floodplain development.

CHANGING COASTLINES AND COASTAL COMMUNITIES

Europe has a strongly maritime character, with heavily indented coastlines and many large peninsulas, offshore islands, and archipelagos. Few areas of Neolithic Europe would have been far from contact with their nearest coastline, even if that contact was an indirect one through trade or exchange over hundreds of kilometres, as evidenced by the movement of the marine bivalve *Spondylus* shell ornaments from the Aegean to Neolithic sites in central Europe (Chapman and Gaydarska, this volume). Coastlines also played an important role as sources of marine food, raw materials, and items of value or decoration; as a medium of communication, travel, and trade by sea; and as sources of inspiration for myth and metaphor.

Marine environmental conditions cover an immense range, from the Arctic to the Mediterranean and from exposed Atlantic coastlines to the protected and tideless basins of the Baltic and the Black Sea. Productivity generally follows a north-west–south-east gradient.

Shallow areas of continental shelf, mixing of the water column by tides and storms, and upwelling currents ensure high levels of marine fertility on north Atlantic and North Sea coastlines, and an abundance of marine mammals and fish. The extensive intertidal flats of large river estuaries and inlets support large beds of bivalve molluscs, and rocky shorelines have relatively abundant supplies of limpets and other gastropods. The Mediterranean is much less productive, with limited tidal movement and clogging of major river estuaries by rapid sediment accumulation, although all types of marine resources are available, from top predators such as monk seals and tuna fish to molluscs. Least productive is the eastern Mediterranean, where temperature gradients trap nutrients at a depth beyond the reach of photosynthesis. The Baltic and Black Sea are intermediate, with little tidal movement, but inflow of nutrients from the surrounding land.

Although agriculture is generally regarded as the dominant mode of production, marine resources continued to be widely exploited. Palaeodietary reconstructions based on stable isotope measurements of human skeletons in parts of Britain and Denmark suggest that marine foods were ignored by some Neolithic people in coastal regions (Richards and Hedges 1999). However, the interpretation of the evidence is controversial (Bailey and Milner 2002; Milner et al. 2004, 2006; Hedges 2004; Richards and Schulting 2006), and archaeological sites show continuing exploitation of fish, sea mammals, and shellfish throughout the coastal regions of Britain, Scandinavia (Clark 1983; Lidén et al. 2004; Milner et al. 2004), south-west Europe (Boyle 2005; Milner et al. 2007), and the Mediterranean (Jacobsen 1968; Tagliacozzo 1993). Submerged Mesolithic and Neolithic fish weirs discovered in Denmark show that the Neolithic examples, as at Nekselø, extended several hundred metres out from the seashore and were larger and stronger than their Mesolithic counterparts (Fischer 2007). For many farming communities in coastal regions, marine resources could provide an important alternative during periods of the year when agricultural products were in short supply (Deith 1988; Milner 2001, 2002). Settlements in northerly regions beyond the range of reliable crop agriculture would always have depended on the sea for a major part of their livelihood.

Seafaring played an important role in fishing and sea-mammal hunting, trade, and population movement. At least one pathway of agricultural dispersal into Europe followed the northern shorelines of the Mediterranean, implying seaborne movements. Occupation of Mediterranean islands and the British Isles required the use of seaworthy boats to import crops and animals and exchange raw materials, even if, as now seems likely, Neolithic colonists were not the earliest seafarers in Europe (Anderson et al. 2010). The

distribution of megalithic tombs has been linked in some areas to the seasonal movements of migratory fish (Clark 1977). Dugout canoes and skin-covered frame boats were already used in the Mesolithic. The earliest timber-planked boats are recorded from the Bronze Age, but were probably also built in the Neolithic, with the sail most probably in use by the late Neolithic in the eastern Mediterranean (Broodbank 2010).

Much of what might be learned about Neolithic coastal environments may be missing because of sea-level change (Pirazzoli, 1991). At the LGM, 20,000 years ago, the sea level was over 100m lower than present and additional territory amounting to some 40% of the current European landmass was exposed on the continental shelf. The loss of territory as sea levels rose with the melting of the ice sheets after 16,000 years had profound effects on the ecology, demography, and social geography of prehistoric Europe, offset to some extent by climatic amelioration and the opening up of new hinterlands. These changes were especially dramatic in shallow areas such as the North Sea (Coles 1998; Flemming 1998, 2004; Gaffney et al. 2009), with their biggest impacts during the late Upper Palaeolithic and Mesolithic. The eustatic (glacial meltwater) contribution to sea-level change was completed with a final sea-level rise of about 15m between 8,000 and 6,000 years ago according to global estimates from deep sea records (Lambeck 1995, 1996; Lambeck and Chappell 2001; Siddall et al. 2003), which overlaps with the early Neolithic in southern Europe.

Additional geological processes affecting sea-level change likely affected Neolithic coastlines more widely. These processes include coastal subsidence or uplift at a local or regional scale in response to tectonic and volcanic effects, particularly in the eastern Mediterranean, and isostatic rebound or subsidence of coastlines following the melting of the ice sheets, particularly in northern Europe. Geophysical models provide estimates of crustal movement (Lambeck et al. 2006; Peltier and Luthcke 2009), but precise changes can only be established by dating local palaeoshorelines, using evidence of submerged archaeological sites, shoreline biomarkers, or sediments such as peat (Shennan and Andrews 2000; Stewart and Morhange 2009). All these sources show that changes of relative sea level continued to occur in many areas during the Neolithic, with variable impacts depending on local topography and bathymetry, and that an important part of the coastal Neolithic in many regions now lies submerged on the seabed, as for earlier periods (Benjamin et al. 2011).

The most dramatic isostatic effects were in regions close to centres of glaciation. In Scotland and northern Scandinavia there was coastal

rebound, with coastlines lifting as much as 200m in northern Norway. Around the southern rim of the North Sea and the southern Baltic, there has been ongoing subsidence, with a corresponding loss of coastal territory and settlements. In Denmark and along the Baltic shoreline of northern Germany, Mesolithic and Neolithic settlements are now submerged in several metres of water (Fischer 2004; Harff et al. 2007). Partially or totally submerged settlements and megalithic sites have been recorded on both the Atlantic and Mediterranean coastlines of France (Geddes et al. 1983; Prigent et al. 1983; Cassen et al. 2011). In the Bulgarian sector of the Black Sea, Neolithic sites submerged by tectonic subsidence have been recovered (Filipova-Marinova et al. 2011). In the eastern Mediterranean, the pre-pottery Neolithic B site of Atlit Yam, Israel, was a coastal village practising farming and fishing and is now submerged in 11m of water (Galili et al. 1993). A Neolithic site on the Aegean island of Aghios Petros, Greece, is partially submerged (Flemming 1983), and recent underwater surveys at Bova Marina on the Calabrian coastline of Italy have drawn attention to the loss of a significant increment of land during the early Neolithic (Foxhall 2005). These changes would also have modified the ecology and configuration of resources available on the local coastline, removed land of potential value for livestock and agriculture, and perhaps influenced Neolithic cosmologies and perceptions of landscape.

More dramatic effects have been claimed in the Black Sea region by Ryan et al. (1997), who used the sedimentary record on the seafloor to infer a catastrophic flood event 7,200 years ago, supposedly resulting from the overtopping of the Bosphorus sill by sea-level rise in the Mediterranean. This in its turn is supposed to have caused widespread dislocation of low-lying settlements on the shores of the Black Sea and triggered the dispersal of farming communities into south-east Europe. However, the geological evidence and the likely human consequences are now not widely accepted. Between 20,000 and 7,200 years ago the Black Sea was a freshwater lake and the water level fluctuated through an amplitude of 90m or more in response to the variable inflow of water from the rivers to the north. However, the sedimentary record in different parts of the basin produces conflicting interpretations about the pattern and timing of these changes, and the re-connection with the Mediterranean may have been more gradual than implied by the 'flood' hypothesis (Yanko-Hombach et al. 2007). Overall, the loss of land locally in different areas of Europe, even if not as sudden as claimed for the Black Sea or as extensive as the Mesolithic inundation of the North Sea Basin, most probably had cumulative effects that were recognized within the lifetime of individuals, and the collective memory and oral

traditions of many coastal societies likely incorporated stories recalling an earlier time of more dramatic land loss. The marked concentration of megalithic tombs and monuments at the coastal extremities of Britain, in the Orkneys, the Isles of Scilly, and in many other coastal regions of Scotland, Scandinavia, and western Europe—some intended to be viewed from the sea rather than from land—attests to the powerful influence of Neolithic seascapes as an arena for day-to-day subsistence, a place of danger, a source of myth, and perhaps the ultimate resting place of the ancestors (Westerdahl 1992, 2005; Phillips 2004).

EMPTY AND SYMBOLIC SPACES—HIGH-ALTITUDE ENVIRONMENTS AND SKYSCAPES

Until recently it has generally been assumed that in the mountainous parts of Europe Neolithic archaeology was restricted to valley floors and the lower slopes (Bocquet 1997). Recent work in the French western Alps at Les Ecrins National Park and the Hauts Ubaye Massif has shown Neolithic activity as high as 3,000m altitude (Walsh and Richer 2006; Mocci et al. 2008; Richer 2009). High alpine grasslands or ‘meadows’ were not empty spaces and had symbolic/ritual importance (as suggested by rock art) possibly related to their utility for summer hunting (Richer 2009). The environment does not only comprise climate, soil, and vegetation, but includes aspects such as skyline and subterranean spaces, both of which vary spatially. Monument construction is testament to a growing human interest in, and desire to record, astronomical phenomena (Hoskin, this volume), alongside many other cultural stimuli. Neolithic monuments aligned on astronomical events like midsummer and midwinter sunrise include wood or stone circles and rows, isolated megaliths, and some henges and long-barrows. These Neolithic structures appear to be geographically restricted to northern Europe and this could at least partly relate to variation in the seasonal skyline, which is a function of latitude (i.e. seasonal variations in the setting/rising positions of the sun and moon). Whilst other factors are clearly also important, both environment and latitude must play a part in the ritualization of the external environment. In wooded areas of moderate relief, the skyline is only viewable in gaps or clearings and the use of distant horizon markers implies a clear line of sight from the viewing location (Brown 1997, 2001). This association of open, or cleared, areas with Neolithic monumental landscapes (or ritual complexes) appears to hold and the augmentation or manipulation of natural events may have ritual and social importance (Evans et al. 1999; Brown 2001).

Studies around Stonehenge on Salisbury Plain, England, suggest partial clearance by the time both Stonehenge and Durrington Walls were being built (Allen 1995). The same is true for ritual complexes on Cranborne Chase in England (French et al. 2005; French et al. 2007) and possibly southern Brittany (Scarre 2001). A fascinating aspect is the extent to which the ritualization of natural phenomena may have been a formative part of tradition, as, for example, with the recent suggestion that the banks and ditches of cursuses monumentalized the tracks of small tornadoes through woodland (Meaden 2009). These environmental phenomena, constraints, and opportunities need to be considered in any attempt to regionalize Neolithic traditions. We also need to explore the possible effects of natural events on the perception and ideology of later Mesolithic and Neolithic peoples (Larsson 2003) in what was still a fundamentally natural vegetation cover until human activities became the dominant driver in the late Bronze Age (Odgaard and Rasmussen 2000).

LINKING ENVIRONMENTAL CHANGE, CULTURAL TRANSFORMATIONS, AND COGNITION

Humans do not experience or record climate, but rather daily and seasonal weather, along with the occurrence of extreme events. There is little doubt that early farming communities would have been highly susceptible to extremes of weather including droughts and floods, and the increasing trend towards food storage through the Neolithic, the Bronze Age, and beyond is generally seen as insurance against shortages given sedentary conditions and an increasing population (Halstead 1999; Rosen 2007). Indeed one of the most common Neolithic features across Europe is the storage pit, often found in remarkable numbers (Garrow 2006).

Whilst droughts and floods are the most obvious climatic hazards, others exist even in the relatively benign environment of Mediterranean Europe. These include volcanic eruptions in tectonically active areas, such as southern Italy, Anatolia, and the Greek Isles. Tephra (volcanic ash layers) are known from this period (Table 2.2) and many more fine tephra in the marine record (Lowe et al. 2007) are of high potential for improving environmental chronologies in southern Europe. Likewise, Iceland is the source of tephra found in mires in Scotland, northern Ireland, northern England, the Baltic States, and Scandinavia (Barber et al. 2008; Pilcher et al. 1996; Hang et al. 2006; Boyle 1998). However, even in the Mediterranean there is as yet little evidence for an eruption causing major population dislocation comparable to the Bronze Age

Minoan civilization or Roman Pompeii. Essential to that narrative are perceptions of risk along with power, wealth, and opportunity, all of which would have to be included in any model of response at the societal level and below.

One approach to linking environment and human actions in the landscape is through modelling, now common in natural sciences like geomorphology. Modelling has moved away from normalizing, rational, and optimizing economic models towards humans as ‘agents’ endowed with behavioural attributes, even perceptions, expressed in a logical rule-like fashion. Spatial modelling has in the past largely ignored perception, presenting a ‘theoretical model of the culture-environment interaction that takes no account of the cultural preconceptions and consequent constrained interpretations that social actors bring to their physical environment before they interact with it’ (Wheatley 1996, 76). Environmental reconstruction can include how past environments looked, felt, and even smelled but, just as with geographical information systems (GIS), environmental models should only be seen as a ‘screen on which to project behavioural and cognitive data’ (Maschner and Mithen 1996, 302) and part of a wider cognitive approach to archaeology (Renfrew and Zubrow 1997). Parallels exist with recent developments in ecology and geography, where agent-based modelling (ABM) models the behaviour of organisms in the face of changing local conditions (e.g. fishing, Kirby et al. 2004) and incorporates non-normative and humanistic data within an environmental framework (Bithell and Macmillan 2007).

So far, applications include modelling food acquisition (hunting, gathering, basic agriculture) and the resultant soil erosion on limestone terrain around middle Neolithic settlements in southern France (Wainwright 2007), modelling change in the Anasazi culture in northern Arizona (Dean et al. 2000), and Mesolithic hunter-gatherer dynamics in the British Isles (Lake 2000). These studies have included the integration of a digital elevation model (DEM), palaeoenvironmental data, and—crucially—agents with rules of behaviour, agricultural or foraging capabilities, locations, and reproduction/mortality. The crucial point is that modelling does not seek to ‘explain’ the past or provide just another narrative, but to explore the construction of cultural interaction by challenging existing theories, demanding specification, and throwing up new questions. ABM is part of constructing culture from the bottom up, rather than generalized theorizing from the top down. In it, agents can be autonomous, goal-oriented, reactive, situated, cognitive, social, and capable of reproducing. Consequently, emergent properties can arise (Mithen 2000), a theme currently being explored in geomorphology and ecology (Harrison and Dunham 1999; Slaymaker 2005).

CONCLUSIONS

Many of the recent advances in environmental and Quaternary science—such as in sediment-based dating (Brown 2011), bio-markers (e.g. Jacob et al. 2009), soil DNA (Hebsgaard et al. 2009), and multi-element sediment scanning—greatly increase the potential to test competing hypotheses in prehistory. This is particularly pertinent as environmental change is commonly seen as rather less important to human society in Neolithic Europe than during the Bronze Age, Classical, and Medieval periods. This belief is partly a function of the longer time-scale and the dominant domestication-based narrative of Neolithic modernity (Renfrew 2007). This is changing for many reasons, such as the awareness of early domestication and agriculture in other regions (Bellwood 2005) and the remarkable advances in archaeogenetics, which are driving a more contingent, episodic, and non-purposive picture of domestication and agricultural adoption (Zohary et al. 1998). Environmental change has an essential role to play in replacing a functional meta-narrative with regionally differentiated, locally mediated, changing human–environment relations, at least in archaeology. Cognate disciplines such as Quaternary Science, however, appear to be developing in an opposite direction with new meta-narratives of global scale. For instance, Ruddiman’s ‘early Anthropocene’ hypothesis sees the reversal of the expected Interglacial CO₂ and methane trend due to agriculture, particularly rice cultivation in the tropics, effectively forestalling the geological trend towards cooler conditions during the late Neolithic after c. 8000 BP (Ruddiman 2005). There is also a rise in deterministic connections between climate and cultural change. As Tipping (2012) has observed, we need to ‘stop rejecting deterministic arguments because they are unpleasant, but instead test them, reject them, or revise them’ (cf. Coombes and Barber 2005). Both the spatial variation in local climates and climate change must have been a component in cultural and social change, especially in early agriculture or ‘Neolithisation’ in Europe, but the questions are to what extent and in what ways. The answers can only come from integrated studies of environmental proxies with high-precision archaeological chronologies. This is why the re-dating of Neolithic monuments in Europe is a major advance (Whittle and Bayliss 2007). This will lead to a better integration of social agendas with landscape creation, a theme so actively promoted within environmental archaeology by John Evans (Evans 1975; Allen 2009). We also need to take on board some elements of the post-processual critique of environmental archaeology and work toward a more in-depth, sensual, and embodied view of the external environment of Neolithic agents in the landscape.

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Movement of Plants, Animals, Ideas, and People

CHAPTER 3

MOVEMENT OF PLANTS, ANIMALS, IDEAS, AND PEOPLE IN SOUTH-EAST EUROPE

JOHANNES MÜLLER

THE domestication and adaptation of local environs were important to the movement and mobility of plants, animals, ideas, and people during the Neolithic and Chalcolithic of south-east Europe, but much also depends on social processes, including inter-group relations and the ‘domestication’ of human behaviour caused by Neolithic economies and ideologies. Population size is especially significant given the necessity to manage subsistence and raw material supplies around domestic sites, and indeed even perhaps a vital precondition for the mobility of people and animals, the spread of new items and customs, and the development of novel ideas. Once started, this movement will be affected by exogamic marriage practices, village alliances to organize transhumance, and the needs and opportunities to gain raw materials. Given these preconditions and social processes, it is hardly surprising that mobility and innovation varied greatly throughout the Neolithic and Chalcolithic, and whilst as archaeologists we observe such processes on a sub-continental scale, regional case studies are often more helpful in explaining this change. The spread of the Neolithic production sphere and ideology during the early Neolithic, the population pressure of late Neolithic society, and the introduction of copper metallurgy during the Chalcolithic constitute three aspects of mobility which will be described, explored, and questioned in the context of one regional case study.

NEOLITHIZATION IN SOUTH-EAST EUROPE: MOVEMENT AND INTERNAL MOBILITY

For nearly a century, different archaeological schools have debated the Neolithization of south-east Europe, repeatedly emphasizing the diverse and complicated processes involved ([Lichter and Meric 2005](#); [Spataro and Biagi 2007](#); [Perlès 2001](#); [Reingruber 2008](#)). Whilst the

introduction of domesticated plants and animal husbandry are economic proxies for the earliest stages of Neolithic societies, new ideologies, which develop a changing lifestyle, are linked to the introduction of novel goods and novel symbols in south-east Europe.

The domestication of cereals started at around 10,000 BC in the Near East, whilst the domestication of sheep, goat, and cattle took place later at around 8000 BC in the southern Levant (cf. [Guilaine](#), this volume; [Lichter 2007](#)). Without discussing the reasons behind these processes, the outcome is clear—the domestication of animals and plants was linked to the domestication of humans, with a sedentary existence, the exploitation and over-exploitation of local environments, and a rapid demographic growth resulting in the expansion of the new lifestyle, as well as perhaps to changes in ecology and climate. The following movement of people, plants, and animals started on a slow but impressive scale in north Mesopotamia.

Rapid Neolithization in Cyprus and Anatolia gave rise to new settlement agglomerations ([Peltenburg et al. 2000](#); [Peltenburg and Wasse 2004](#); [Knapp 2008](#); [Özdoğan 1997](#)). Within a favourable environment, the clusters of Neolithic hamlets and villages shaped agricultural core areas: tell settlements were founded, cereal cultivation and animal husbandry practised, and surrounding raw materials exploited for tool manufacture.

The subsequent ‘Neolithic wave’ took two forms. One was westward via the marine world of the Mediterranean, the other was by ‘terrestrial’ drift across south-east Europe and central Europe ([Price 2000](#); [Bocquet-Appel et al. 2009](#)). Even though there is now some consensus about the time scale and direction of these processes, the character of change is still much debated. In regard to south-east Europe, one viewpoint emphasizes the step-by-step introduction of Neolithic economy and ideology along Epipalaeolithic and Mesolithic communication networks, with the consequence that the introduction of different Neolithic elements differed spatially. According to this interpretation, Neolithization is largely perceived as the acculturation of foraging communities as they select Neolithic elements and integrate them without major social changes in their economic system and society (e.g. [Chapman 1994a](#), 135; [Kotsakis 2001](#)). Another viewpoint envisages ‘leap-frogging colonization’ whereby small groups of people move into agriculturally suitable core areas in south-east Europe, which then become central spots for further regional developments (e.g. [Biagi et al. 2005](#)). The Neolithic therefore ‘arrives’ as a package along with a new people, both being distinguishable from those with a forager background (if still present and not depopulated by new germs and epidemic diseases). Others emphasize both viewpoints with the arrival of new groups and the acculturation

of fishers and foragers as these communities interact. The archaeological evidence certainly points to a mosaic of social changes and movements which differed from region to region (Budja 2005; Whittle 2004).

In the Aegean at no later than 6500 BC some elements of the Neolithic appear (Perlès 2001, 94). Domesticated wheat and sheep are known from Knossos on Crete and perhaps some sites in Thessaly and the Argolis, whilst a few contemporary sites still indicate a Mesolithic way of life. Obviously, networks linked small fishing and foraging communities to the farmers of Anatolia or the east Mediterranean. The distribution of Melos obsidian indicates such a network between Anatolia and the Aegean (Fig. 3.1). In spite of these new plants and animals, fundamental changes in economic and social life did not occur. Rather, they represent the integration of new customs, items, and subsistence strategies into traditional daily routines and practices via the wider interaction networks of coastal societies.

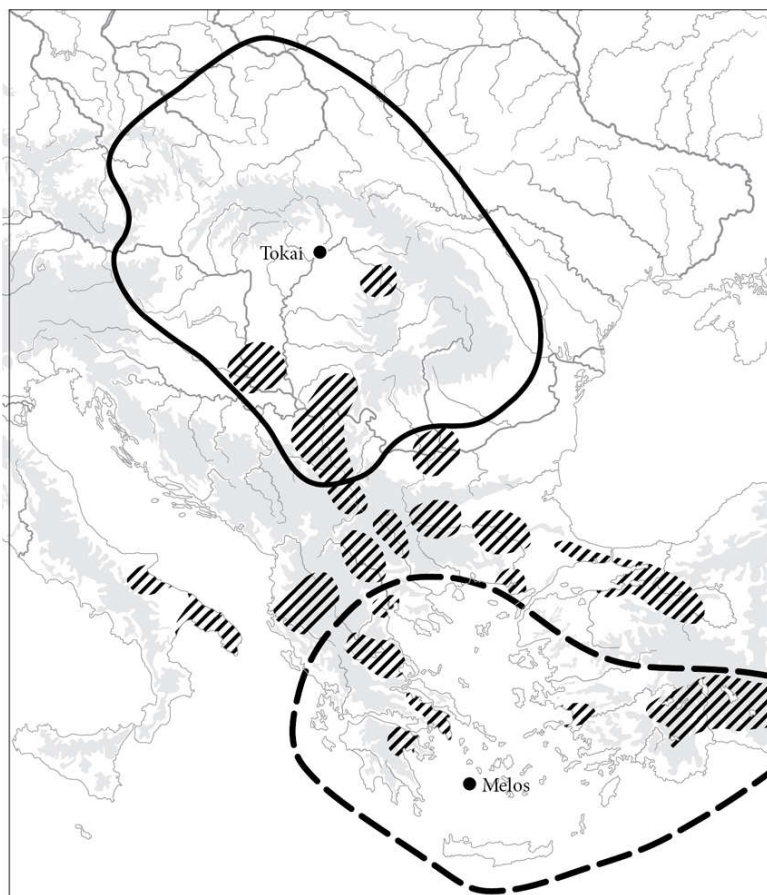


FIG. 3.1. Early Neolithic networks in south-eastern Europe: obsidian from Melos and Tokai alongside major clusters of Neolithic mainland settlement before 6100

A hundred years later this had changed ([Reingruber 2008](#)). Thrace and the Marmara region produce settlements where fishing and farming were the main elements of the subsistence economy, and throughout Thessaly, Macedonia, and the Marmara region the entire package of Neolithic innovation appears ([Perlès 2001](#), 121). In small patches of the landscape, both fertile and near the sea, farming communities established a new way of life, in some cases through the acculturation of foragers (e.g. on the islands), in other cases through the immigration of whole farming communities. This change of lifestyle was associated with new occupation patterns across landscapes, best illustrated by the occupation and inland colonization of Thessaly by Neolithic groups. The ecological conditions of the fertile basin favoured small-scale agriculture. Neolithic occupation started around 6300 BC with a clear spatial (political) division of the plain by various communities, which established permanent settlements. As a result, settlement mounds (tells) were established, the land division supported equal numbers of inhabitants at each site, and the population density rose to about 30 persons per square kilometre during the early Neolithic. Without further analyses, the characterization of these Thessalian processes is difficult. Nevertheless, two arguments speak against clear links to the local Mesolithic. First, there are no typological and economic similarities. Second, the absence of late Mesolithic remains points to a sparse foraging population before the arrival of Neolithic communities.

The 'newcomers' (but where exactly did they come from?) introduced a new economy, a new social order with new political institutions, and a new lifestyle. Small rectangular houses of mud-brick, brick clay, or timber-and-daub were home to single households and these were agglomerated in small villages of up to 100 inhabitants ([Müller 2007](#)), often forming impressive tells through their continuous use. This repeated occupation of one place for domestic purposes shows that settlements had become places of memory and tradition. Domesticated sheep, goat, cattle, and emmer and einkorn wheat were herded or planted in increasingly open landscapes. Different cooking and storing techniques are indicated by the introduction of both coarse pottery and nicely decorated fine pottery. The household mode of production is bound into village life and communal endeavours like field systems and the herding of the flocks. The deposition and recycling of waste demands the spatial organization of activity areas (at least within the settlements). Social organization is more complicated, perhaps even stratified. Some individuals were buried

within the settlements and the majority of burials are without grave goods. House altars and figurines signal a well-established sacred sphere ([Chapman and Gaydarska 2007](#); [Hansen 2007](#)). While from an archaeological viewpoint these societies are not linked with foraging precursors, connections to the Anatolian Neolithic exist in material culture and social organization. Similarities in ornamentation, in the subsistence economy, and of arranging villages and local environs back the idea of Anatolian people moving in. In this sense, the introduction of the ceramic Neolithic into south-east Europe has to be seen as an innovation, founded on the movement of small groups of mobile individuals into new environs. This seems to be true in spite of the lack of aDNA evidence.

Instead of a 'Neolithic wave' which reached Europe and 'flooded' south-east Europe, further Neolithization took place in stages (e.g. [Banffy 2004](#)). It was detained in northern Macedonia until 6100 BC for reasons as yet unknown. Interaction, communication, and mobility took place within the Aegean-Anatolian sphere, but not further north. Yet from around 6100 BC it took only a few generations for the Neolithization of most of the Balkans, the Carpathian Basin, and other regions of south-east Europe ([Biagi et al. 2005](#); [Bocquet-Appel et al. 2009](#)).

The sudden establishment of early Starčevo-Criș-Körös communities saw the introduction of the Neolithic way of life in fertile core areas. Whereas material culture still shows no links to foraging groups, the variation of sites and cultural environs gets more diverse. In some areas the creation of tells is observed, in others not. Short-lived domestic sites with shifting households shape more and more of the domestic sphere. The composition of livestock gets more varied—beside sheep and goat, cattle husbandry becomes more important. The variation of cereals also increases. Other aspects of material culture demonstrate dissimilarities. Ceramic design still followed shapes and decoration patterns already visible in the Aegean-Anatolian area, but regional diversity was increasing (e.g. [Schubert 1999](#)). Within generations, regional styles had developed which might be seen as proxies of local and regional communication and interaction spheres.

The transformation of the south-east European landscape during the Neolithic is clearly linked to questions about the degree of mobility within and between existing networks and the creation of new networks. The development of diverse Starčevo-groups with a similar record of the regional material culture as from c. 5800 BC underlines the adaptation of local environs and the forming of local and regional communication spheres. Cross-cultural links are difficult to detect. Apart from the introduction of houses and objects similar to those in the south, independent developments are obvious. This is linked to

inner colonization and the establishment of new groups. Both depend very much on the demographic development of societies, thanks to successful adaptations of local and regional environs as well as successful social organization. The development of late Neolithic societies in south-east Europe is a clear continuation of these processes.

The flow of items and resources would have been necessary for production and reproduction, and indicates the interaction spheres of early and late Neolithic communities in south-east Europe. For instance, the early and late Neolithic communities of the Carpathian Basin were dependent on raw materials which were available in the Bükk mountain range or the Bihar mountains, sometimes more than 100km away (Raczky et al. 1996; Kaczanowska and Kozłowski 1994). Local communities probably arranged expeditions, such as to the Tokay obsidian sources, where material was collected for use elsewhere. Similarly, flint material was only available in remote areas, but was nonetheless transported to the main settlements. Thus, the necessities of the subsistence economy and of tool production were responsible for some kind of mobility to areas surrounding the Carpathian Basin. In some cases, hundreds of kilometres had to be overcome to gain such materials, furthering contact with other groups and other societies.

The long-distance exploitation of raw materials may have been complemented by another form of mobility on a comparable scale—long-distance transhumance. Whilst there are many methodological difficulties with identifying such transhumant activities, early Neolithic Adriatic Impresso societies are a good example.

Impresso—an example of transhumance

The Adriatic Basin is mainly formed by the Dalmatian eastern Adriatic coast below the Dinaric limestone mountains and by the Italian coastline below the Apennines. Early Neolithic communities with a distinct type of impressed pottery are found here in both Dalmatia and Apulia. These transadriatic societies were integrated into a network of interaction: they were connected to local late Mesolithic foragers, including those in the Dinaric Alps, but also to early Neolithic groups, namely Starčevo-Criș-Körös communities (e.g. Müller 1994, 205–227; Spataro 2002), in the central Balkans. Yet the Adriatic Impresso is a purely Mediterranean phenomenon, and as such contrasts with continental development. The infiltration of Impresso pottery patterns into the Balkans via the Neretva route highlights the differences between the two: it resulted in Impresso-decorative patterns on pots with Starčevo organic tempering, hence reflecting the integration of

Adriatic elements into an otherwise purely Starčevo production sphere.

There are more than 50 sites with Impresso pottery, ranging from the Trieste Karst at the border of northern Italy, to the Albanian river Mat in the south. Whilst open settlements cluster in fertile *terra rossa* plains distant from the sea, cave sites are distributed at altitudes of 1,000m in the Dinaric mountain range. The mountain range offered the potential for gathering or hunting, but also for herding in plateau areas. In contrast, the coastal zone displays *Flysch* valleys between limestone ridges, covered by *regosols* or mineralised *terra rossa* areas. Near rivers and the rare karstic springs, it was of great potential for farming, including cereal cultivation. The coastal islands possessed huge marine resources (Müller 1994, 50–71).

There is some evidence for the differing function of Impresso sites (Müller 1994, 50–71). Early Neolithic open settlements are concentrated in agricultural core areas like Istria and central Dalmatia, and more specifically on the border of the *terra rossa* plains near a water source. By contrast, most cave sites are distributed on karstic soils in the high mountain range, but interestingly near deeper valleys, which in some cases possess the potential for agricultural activities. Bone analysis confirms the distinction between open settlements and what may be upland herding camps. According to different authors (e.g. Mlekuz 2005; Schwartz 1988), domesticated sheep and cattle, along with a respectable percentage of domesticated pig bones, were found on the open site of Smilčić, whereas at the cave sites of Gospodška pecina and Odmut domesticated pig bones are nearly absent, suggesting their use as herding places (in the case of the huge dominance of domesticated animals) or even hunting camps (in the case of the dominance of wild animals) by ‘lowlanders’.

Thus, the subsistence economy of Impresso communities adapted to the potential of the eastern Adriatic environs: there are permanent agricultural settlements in coastal areas and base camps in the higher Dinaric range for transhumant herding purposes (and perhaps fishing camps on peninsulas and the islands, too). As the transhumant sphere of Impresso groups overlaps with the site catchments of Castelnovian Mesolithic groups, signs of social interaction between them are hardly surprising (Fig. 3.2): there is goat (Odmut), cattle (Crvena stijena), and pottery from Mesolithic sites, albeit with no matching Mesolithic elements on Impresso sites. There may have been a special kind of interaction between foragers and farmers. If we look closely at their distribution, late Mesolithic sites are absent from the core areas of Impresso open settlements, and only found in regions with Impresso ‘base camps’ for hunting and herding. Communication between communities with two totally different economic systems most

probably only took place in certain areas.

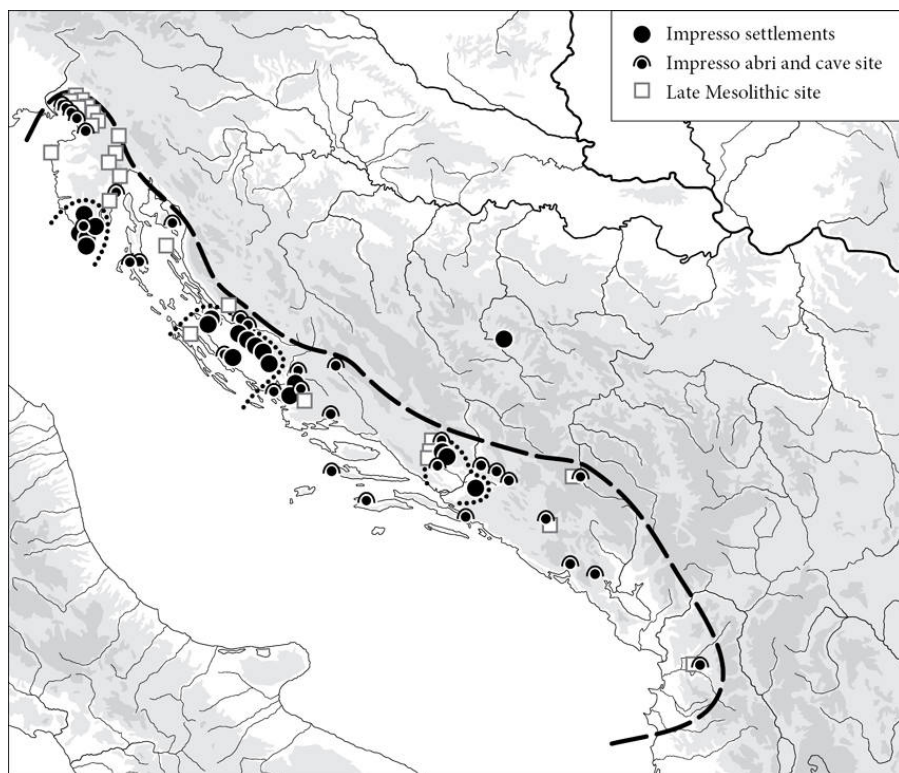


FIG. 3.2. Transhumance and communication: the Dinaric example of early Neolithic farmers and Mesolithic foragers. Boundaries of agricultural core areas are marked by the dotted line and transhumant activities by the broken line.

(drawing by Holger Dieterich, Kiel).

The inter-relation between the continental Starčevo and the Adriatic Impresso sites is less important. There are significant differences in the temper material and decorative patterns of the two ceramic traditions and figurines do not occur in Dalmatia (Müller 1994, 212). Only the communication route along the Neretva produced a special situation in Bosnia, with Odmuť and Obre both yielding Impresso and Starčevo material. Here at least, the ideological differences between central Balkan communities and the Impresso groups—best demonstrated by the latter's failure to use Starčevo ritual artefacts—were perhaps overcome by common economic interest.

MOBILITY AND DEMOGRAPHY: LATE NEOLITHIC BUTMIR

Mobility is also highly dependent on factors such as population size and population density. If local environs are not large enough to satisfy subsistence demands, parts of a population have to become mobile for at least some of the year in order to gain access to other ecological zones. Group size and mobility is also closely linked to marriage behaviour and personal inter-relations: with villages limited to about 200–300 inhabitants, exogamy was required for the population to successfully reproduce.

Group size and population pressure are likely to have played a key role in the development of agricultural core areas during the Neolithic and Chalcolithic. Yet interpretation is problematic, with models of emigration and immigration dependent on estimated population growth, the intensity of interaction, and social classification or identity. Even where we know all these variables, a detailed reconstruction of demography as a proxy for mobility remains difficult (Müller 2007). Given the lack of proper archaeological data and problems with spatial analysis, demographic reconstructions are rare. Nevertheless, research on late Neolithic settlement size and population density in the Butmir occupation of the Bosnian Visoko basin of the central Balkans (Fig. 3.3; see Hofmann et al. 2007) exemplifies the possibilities and the consequences of such efforts for the discussion of mobility and movements.

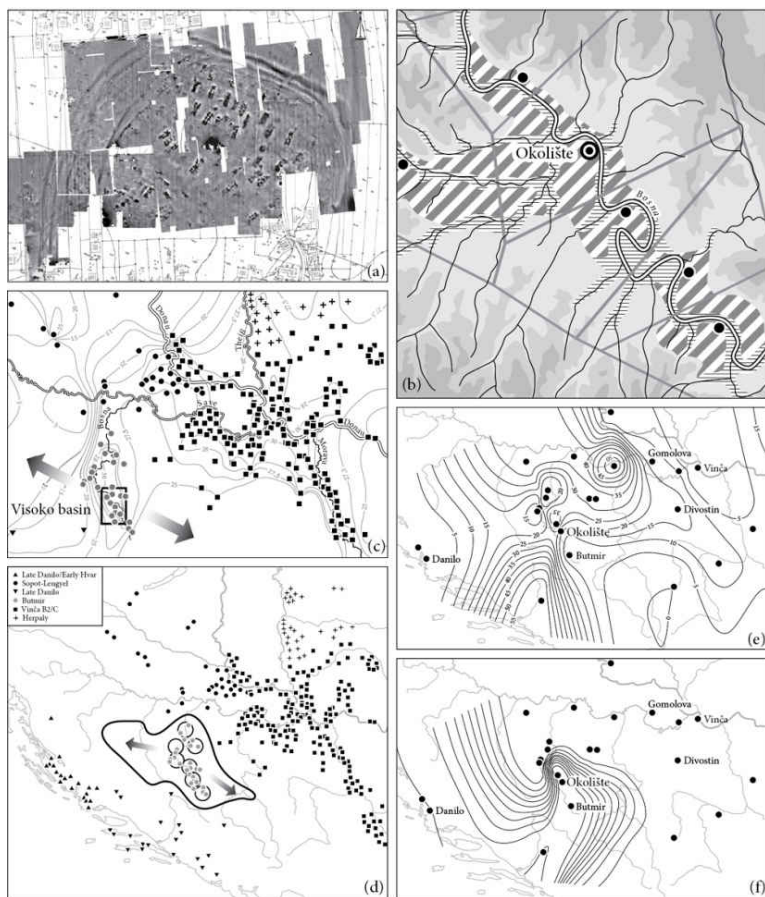


FIG. 3.3. Okolište, the Visoko basin, and the reconstruction of local and regional late Neolithic mobility: a. Okolište; b. Visoko basin with domestic sites and arable land (hatched); c. estimated population densities in late Neolithic middle Danubian area and Bosnia (isolines, person/km²) and suggested herding activities of the Visoko communities into unpopulated mountain ranges (arrows); d. the estimated herding area of late Neolithic Butmir agricultural core areas; e. the percentage of late Neolithic impressed pottery; f. the boundary between arrowheads (Adriatic) and sling shots (Danubian) in the Neretva-Bosna area.

(drawing by Holger Dieterich, Kiel).

Survey and excavation have focused on the settlement mound of Okolište, which lies 30km north-west of Sarajevo at the river Bosna. Within the three basins in which settlement is focused ('Siedlungskammern') are 34 sites with Butmir ceramics (5300–4700 BC). The Visoko basin has a size of 110 sq. km and lies 400–410m above sea level. It is formed by Pleistocene river terraces and para-brown soils. Miocene mountains up to 1,000m (marl and sandstone with rendzinas) encircle the basin. Survey and prospection have

discovered further late Neolithic tells from the area.

The evidence here has certain advantages for calculating population density. It is possible to establish the organization and household density of the latest settlement horizon at Okolište, and the duration of occupation and approximate number of houses at other late Neolithic sites across the Visoko basin and around Kakanj (e.g. [Peric 1995](#)) can be calculated. Most of the Visoko sites came to an end around 4800–4700 BC.

The Okolište tell is 3.5m high and 7.5ha in size. During at least the latest settlement horizon it had geometrically organized house rows and a huge defensive system of three ditches, one rampart, and a palisade built during Butmir II (4800–4700 BC), all of them surrounding 3.5ha. The contemporaneity of the houses is very probable, with their ceramics of Butmir IIb character and most of the C14 dates belonging to 4800–4700 BC. A minimum of 200 houses can be extrapolated from the excavated evidence. They were destroyed in a huge, disastrous fire.

Elsewhere, domestic sites like Obre II—excavated in the 1960s ([Benac 1973](#); [Gimbutas 1974](#)) and recently investigated by geomagnetic survey—are 2–3ha in size with an internal layout comparable to Okolište, but lacking its defensive system. About 50–150 contemporary houses for each settlement can be calculated using the house number/site size ratio at Okolište. Consequently, we are dealing with no less than 700 houses during the Butmir II occupation of the Visoko basin. Small house size (60 sq. m) suggests a household of about five people. The Visoko basin would therefore have a population of 3,500 at c. 4800 BC.

Botanical analyses from Obre II and Okolište indicate the growing of emmer, einkorn, barley, and millet ([Kucan 2007](#); [Renfrew 1974](#)). Palaeozoological analyses prove the dominance of cattle at both sites ([Benecke 2007](#); [Bökönyi 1974](#), 66). Pedological and climatic data from the Visoko basin suggest it had similar agricultural productivity to central Europe (cf. [Ebersbach 2003](#); [Ebersbach and Schade 2004](#); [Zimmermann 2002](#)), and if we take into account several calorie requirement models, based on ethnographic archaeological research ([Ebersbach 2002](#), 81, 107–121; [Gregg 1988](#)), 1.5ha of cultivated land and 50ha of pasture are necessary for a household of five people.

A total of 10.5 sq. km of cultivated land and 350 sq. km of pasture were required to feed the 3,500 inhabitants of the Visoko basin around 4800 BC. [Figure 3.3](#) models settlement boundaries and the arable ‘territory’ of sites. It assumes an open landscape along the Bosna river without any non-arable areas between settlements. Only about 250 sq. km of pasture was within a day’s march of these sites, so some kind of mobile stock farming in the surrounding mountainous

areas would have been necessary. Such practices (cf. [Ebersbach 2002](#), 158) have been ethnographically documented for south-east Europe during different periods under similar conditions ([Beuermann 1967](#)).

This modelling can go one step further. If the population density of the Visoko basin was similar to other Butmir core areas, then a population of c. 32,000 across the 1,000 sq. km of this cultural group's distribution can be extrapolated. Counting half the mountainous landscape between Butmir and other groups as belonging to the former gives a 'territory' of 18,000 sq. km, and accordingly, a general population density of 1.8 persons per sq. km ([Fig. 3.3](#)).

Whilst population density and land use indicate local mobility in the form of transhumance, other spheres of late Neolithic life were organized differently in respect to the movement of people, items, and ideas. Late Neolithic material culture illustrates a steady 'flow' of symbols and signs up and down the Bosna-Neretva communication route: a corridor of interaction is certainly demonstrated by late Neolithic impressed pottery, which was produced locally along the named route, but which shared a common design and decorative tradition. In this case, material culture exemplifies the linkage of local groups and perhaps even the sorts of contacts that social factors like marriage custom would generate. Interestingly, during both the early and late Neolithic the appearance of different ceramic types in Bosnia appears structured. The restriction of certain 'Adriatic' or 'Danubian' types appears to mirror political control over communication in this area of the Balkans and whether local institutions gave way or not to foreign influences on their own household units.

Whilst ceramic design mirrors the local constraints of social relations, and transhumance the regional organization of subsistence, late Neolithic weaponry shows an affiliation to political tradition. The contrasting distribution of arrowheads and sling shots cuts Bosnia in half, highlighting the complexity of boundaries and mobility in the late Neolithic world of the Balkans. This pattern in weaponry is transcended by the flow of other design types like impressed decorative patterns and by raw materials being found across both parts of Bosnia. Special flint materials were imported from the north into the Bosnian central zone. The economic, social, and ritual spheres of late Neolithic societies hence reacted quite differently to the spatial dimensions of communication and separation. In consequence, late Neolithic individuals in the Bosna valley were confronted with different types of mobility and different motivations for accepting and integrating foreign items and people into their local community.

COPPER AGE DEVELOPMENTS

The introduction of copper metallurgy was to have a profound impact on the communities of south-east Europe and upon patterns of mobility. Whilst the reasons for its development are still a matter of discussion, its chronology and geographical spread can now be described (Lichardus 1991; Parkinson 2002; Strahm 1994; Todorova 1982). The earliest copper artefacts are known from Veselinovo and Karanovo III sites in Bulgaria and Vinča B sites in Serbia. Nevertheless, the first evidence of metallurgical working—including the full range of processes from smelting raw materials through to casting and the final making of copper artefacts—dates from 4800 BC onwards from Maritsa in Bulgaria, Vinča C in the central Danube, and Herpaly and Theiss in the Tisza region. The copper mines in Rudna Glava and Ai Bunar, probably set up already c. 5000 BC, symbolized the importance of copper production for Thracian and Danubian communities. This more or less industrial scale of copper production was to promote social differentiation within early Chalcolithic societies, especially during Vinča C/D and Kojadermen-Gumelnița-Karanovo (KGK) VI. Around 4500 BC, during KGK VI and Vinča D, important social differences are displayed at the Varna cemetery and by the spatial differences between houses on the settlement mound and much of the surrounding flat area at the sites of Pietrele and Czóshalom as a result of metallurgy (Hansen et al. 2004; Raczky et al. 2002).

The origins of the Chalcolithic in south-east Europe are unclear. Although metallurgy is known in Anatolia from around 6000 BC, evidence for its existence is limited (Pernicka et al. 1997). The role and quantity of Anatolian copper products in Çatal, Hacilar, and Ilipinar is in each phase small, and certainly much smaller than at the KGK VI and Vinča sites of around 4500 BC (Fig. 3.4). Contacts between Anatolia and south-east Europe are assumed, yet it appears that the ‘idea’ of metallurgy in Bulgaria and west Asia possibly differed. Early copper metallurgy in south-east Europe may have therefore emerged as an independent innovation. Beside regional ornament types, it appears mainly heavy copper axes were produced.

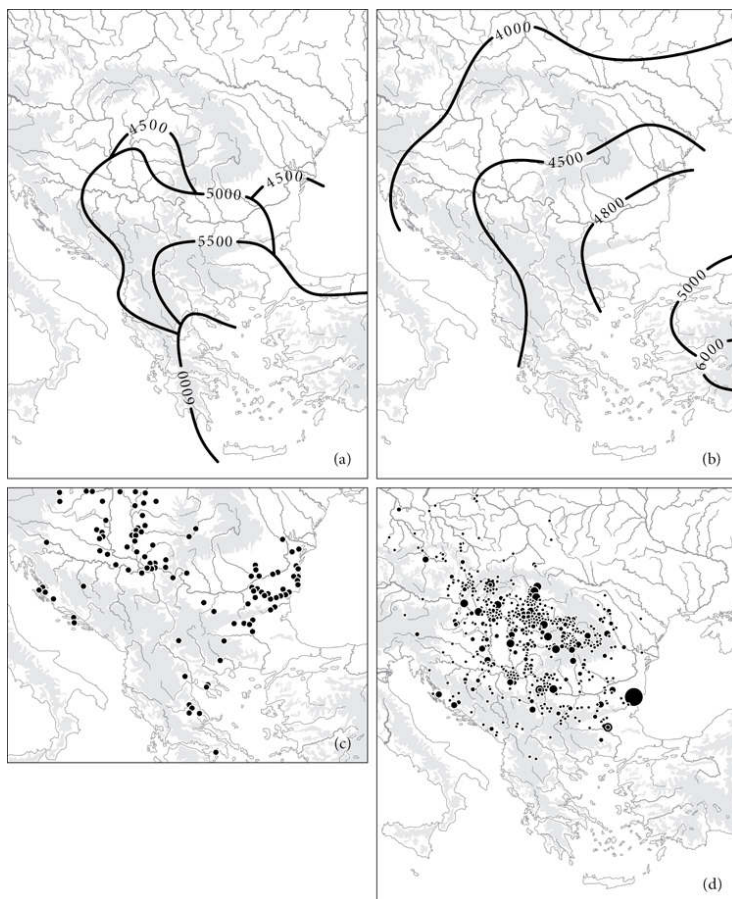


FIG. 3.4. Distribution of tell settlements (a), copper production (b), *Spondylus* artefacts (c), and shaft-hole axes (d) in south-east Europe. The lines are chronological estimations of their spread BC

(drawing by Holger Dieterich, Kiel).

This innovation was accompanied by important changes in the social and political system. The symmetrical and rectilinear layout of concentrated occupation at tells is not just a matter of planning, but also of social control ([Chapman 1994b](#)). Ovcarovo is one example of such a tell site. These organized settlements with defensive systems were linked to a change in the spatial organization of burial, cemeteries in the vicinity of sites replacing burial in the settlements themselves ([Todorova 2002](#)).

Social stratification resulted in a need to express social status ([Müller and Bernbeck 1996](#)), thereby enhancing the flow of goods, and especially exotic goods, in south-east Europe. Beside elaborate copper artefacts, gold and shell objects assumed different values, as illustrated by the grave goods of Varna ([Müller 1997](#); cf. [Fig. 3.5](#)):

gold objects were found in graves with the largest number of objects, whilst *Spondylus* and copper objects are associated with a second group of individuals. They are still richly equipped, but not as clearly linked to important supra-regional networks as those with gold and other objects. Here access to exotic and expensive objects like gold artefacts was restricted to elderly men, who had obviously monopolized social knowledge and controlled the exchange system.

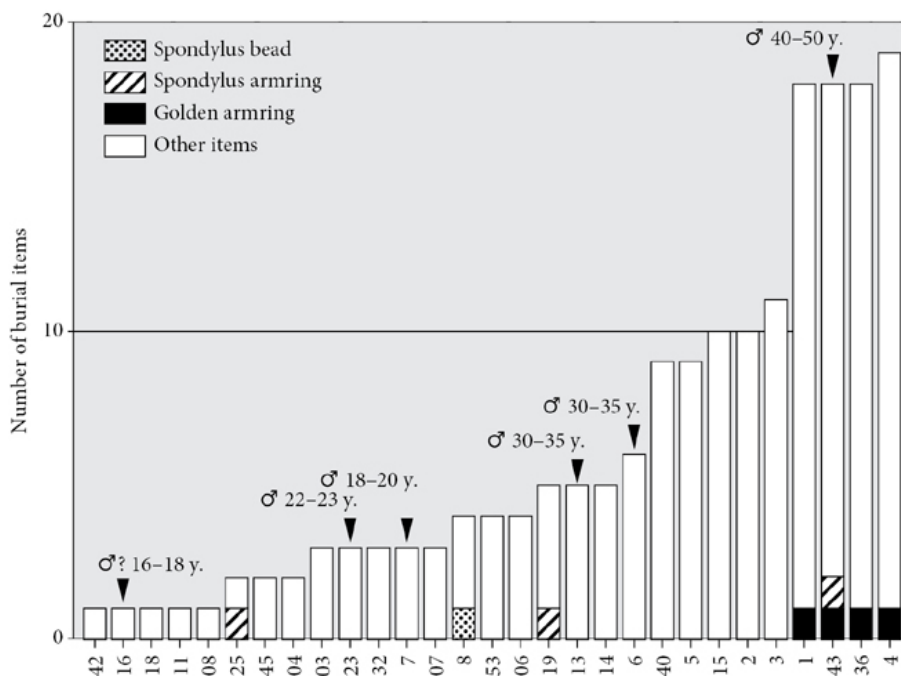


FIG. 3.5. The distribution of local and exotic items in burials of the central area of the Varna cemetery.

(drawing by Holger Dieterich, Kiel).

The extent of Copper Age societies and their exchange systems is represented by the distribution of copper shaft-hole axes and *Spondylus* artefacts. *Spondylus* artefacts are distributed all over south-east Europe and seem to assume a higher value the further they are from the Mediterranean and Aegaen, since in central Europe they are only found in the richest burials. Copper shaft-hole axes are widely known across the Carpathian Basin and as far away as southern Scandinavia (Klassen 2004). Continental north-west-south-east networks clearly functioned to link together different groups who themselves were at different technological levels. These networks are responsible for the distribution of ideas and the flow of goods between neighbouring villages and societies. Many innovations, which had already reached south-east Europe during the early Neolithic, are

transformed during the Chalcolithic of northern regions. [Figure 3.4](#) summarizes the major flows of some of these ideas and inventions, charting the distribution of tell sites, copper production, shaft-hole axes, and *Spondylus* shell products. New social orders are created in the Carpathian Basin, leading to independent regional developments like the Tiszapolgár and Bodrogkeresztur ([Banffy 1991](#); [Parkinson 2006](#)).

Despite these typological similarities and the flow of items, the few demographic calculations available for the Chalcolithic do not indicate population rates much different from the late Neolithic ([Müller 2007](#)). There is little evidence for demographic pressure impacting on the movement of people. aDNA and strontium isotope analysis suggest the movement of local and regional cattle populations via herding networks, but if there had been a steady flow of items and animals it was not matched by human immigration ([Bollongino 2006](#); [Giblin 2009](#)).

Tell sites were abandoned from the second half of the fifth millennium BC in the Carpathian region, and by about 3800 BC elsewhere in south-east Europe ([Link 2006](#)). The demise of the ‘tell cultures’ was not an abrupt event resulting from the invasion or influx of Pontic steppe populations. Rather, tells were abandoned individually and not as part of a synchronous process. New communication patterns arose, with a change in the range of strontium isotope values between tell and non-tell societies in the Carpathian Basin indicating that local populations became more mobile, perhaps because they were now part of less integrated social units ([Giblin 2009](#)).

Starting around 3800 BC, the Boleráz-Cernavoda III ceramic tradition linked the lower and middle Danube regions ([Furholt 2008](#)). The communication network integrates both these important spatial foci of Chalcolithic development. New innovations took place, but the absence of economic data makes it difficult to identify and describe the processes at work. Some time around 3500 BC the wheel and wagon were introduced across central and eastern Europe ([Bakker et al. 1999](#); [Maran 2004](#)). This switch to the use of draught animals for traction must have been linked to economic transformations, and large quantities of spindle whorls point to the introduction of woolly sheep and changes in textile production.

It is difficult to identify the level of mobility associated with these innovations, but the Boleráz/Cernavoda III and Baden sequences mark the emergence of supra-regional archaeological groups united by distinctive similarities in material culture. Whilst it is possible to reconstruct mobility during the Neolithic and early Chalcolithic, the character and driving force of late Chalcolithic interaction is still

poorly understood. What is clear is that these processes lead to new social inter-relations and the resulting exchange systems of tin bronze which characterize the Bronze Age.

CONSEQUENCES

The mosaic-like introduction of farming subsistence strategies into south-east Europe enhanced the mobility of groups and interaction between them. Both the economic potential of different ecological settings and population sizes in agricultural core areas were responsible for Neolithic and Chalcolithic local and regional mobility. The demands of complex societies for ritual activity and social prestige items furthered long-distance barter. With the ending of tell settlements in south-east Europe, the spatial scale changed again to broader possibilities of regional movement due to less integrated social structures. Nevertheless, the agencies of supra-regional archaeological phenomena, starting at around 3800 BC, are still a matter of discussion.

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CHAPTER 4

THE NEOLITHIZATION OF MEDITERRANEAN EUROPE MOBILITY AND INTERACTIONS FROM THE NEAR EAST TO THE IBERIAN PENINSULA

JEAN GUILAINE

THE spread of a Neolithic lifestyle throughout the Mediterranean basin was highly dependent on the same processes which permitted its emergence in the Near East. In the latter area, four chronological stages are evident in its establishment:

- Epipalaeolithic (12,000–10,000 BC): In Palestine and on the middle Euphrates, Natufians hunted gazelles and other types of game (boar, goat, deer, cattle), harvested wild cereals, and in some localities (e.g. Mallaha) experienced sedentism. They built partially subterranean circular houses with stone walls and with probably light superstructures. The dead were buried within the settlement or next to it. One animal was domesticated: the dog. A similar evolution is presumed farther east in Upper Mesopotamia (the Nemrikian) ([Aurenche and Kozłowski 1999](#)).
- Proto-Neolithic (10,000–8700 BC), Khiamian, and PPNA (Pre-Pottery Neolithic A): After the deterioration in climate in the Younger Dryas period, the development of permanent settlements continued. Houses remained circular and were often subterranean. Public buildings of probable ritual function occur next to individual habitations (the tower of Jericho, the subterranean buildings of Jerf el Ahmar, the monuments with megalithic steles at Göbekli Tepe) ([Schmidt 2006](#)). Crop cultivation emerged, although seeds had not yet undergone morphological changes (incipient agriculture). Hunting was still practised.
- Pre-Pottery Neolithic B (8700–7000 BC): During its early phase (early PPNB, 8700–8200 BC) wheat and barley assumed a morphologically cultivated form while the control of ungulates was reinforced in the northern Levant (pig, sheep, goat, cattle). From that time on, houses exhibit rectangular, sometimes elongated, multicellular plans (e.g. Çayönü). During the middle PPNB (8200–7500 BC) and late PPNB (7500–7000 BC), animal domestication was finalized, although hunting remains an important subsistence strategy. Site variability was emphasized and very large major settlements exceeding 10ha in size occur (Abu Hureyra, Syria; Ain Ghazal, Jordan). Anthropomorphic representations became increasingly frequent and ranged

from small figurines to real statues (Yeni Mahalle at Urfa, Turkey; Aïn Ghazal, Jordan). Complex ceremonies were practised, indicating the social and religious organization of these communities (e.g. removal and plastering of skulls). Important distribution networks (obsidian from Cappadocia and eastern Anatolia, stone vessels and armrings, shells) are affirmed within this 'PPNB *koine*' (Bar Yosef 2006).

- Pottery Neolithic/PPNC (7000–6500 BC): The collapse of the PPNB *koine* is characterized by the dislocation of distribution networks and the emergence of regional cultural units. Various pottery styles appeared c. 7000 BC—Dark Faced Burnished Ware with impressed decorations from Cilicia to Lebanon, smoothed pottery in Anatolia (e.g. Çatal Höyük) or in the Balikh-Euphrates sector (Le Mièrre and Picon 1999)—whilst the Pre-Pottery evolution continued in other regions, like the southern Levant, before breaking up and being replaced in the latter area by the Yarmoukian ceramic culture c. 6500–6200 BC (Garfinkel 1999).

THE EMERGENCE AND DEVELOPMENT OF THE NEOLITHIC IN CYPRUS

Epipalaeolithic groups established themselves on the island by 10,000 BC. On the only site dated to this period (Aetokremnos, on the peninsula of Akrotiri), their economy is based on catching birds, batrachians, and reptiles, on collecting shells, and perhaps on hunting wild boar. People's role in endemic fauna extinction (pygmy hippopotami and dwarf elephants) has been discussed (Simmons 1999 versus Binford 2000).

During what is the PPNA phase on the Near-Eastern mainland (10,000–8500 BC), poorly known human groups were present in Cyprus. Lithic evidence from Asprokremmos at Agia Varvara and Thrombovounos at Ayios Tychonas is similar to contemporary Near-Eastern assemblages of burins, obliquely truncated blades, blades with sickle gloss, and leaf-shaped projectile points (McCartney et al. 2007). The economic status of this population is not yet clear, but was possibly characterized by incipient agriculture and the hunting of some local species (e.g. boar).

Population growth seems to occur during the early PPNB (8500–8000 BC), as shown at Shillourokambos (early phase A), Kalavassos-Tenta (phase 5), and well 116 at Mylouthkia (Guilaine and Le Brun 2003). Architectural structures were built with wood and daub, as with the circular shelters and fenced enclosures at Shillourokambos (Guilaine and Briois 2006) (Fig. 4.1, 1 and 2). From now on, agriculture was based on domestic wheat (*Triticum dicoccum*, *Triticum monococcum*) and barley (Peltenburg 2003). Sickle blades have close counterparts on the mainland. Obsidian imports from the volcanic region in Cappadocia (Göllü dağı) became regular. Pig, goat, and cattle

were herded, whilst hunting focused on wild boar. Wells were dug to exploit the ground water resources.

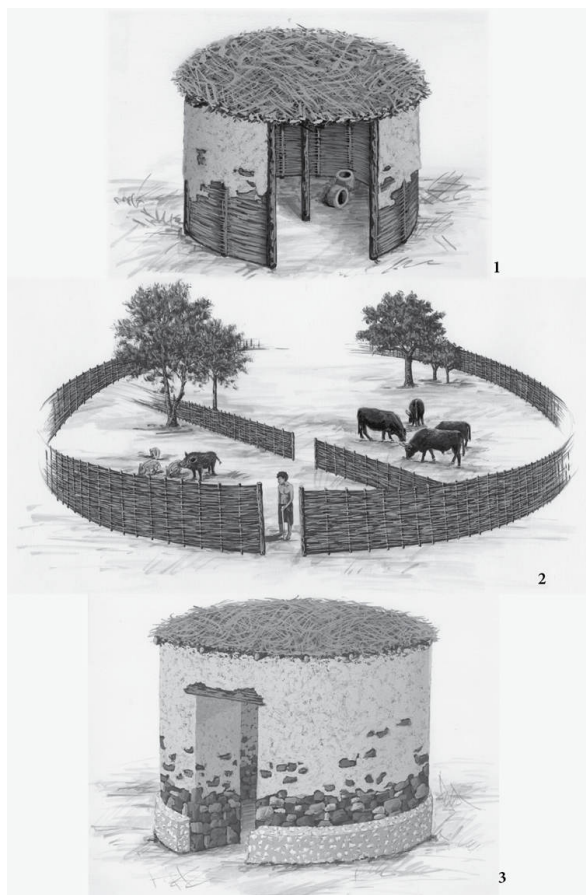


FIG. 4.1. Reconstruction of Parekklisha-Shillourokambos, PPN, Cyprus: 1. wood and daub shelter (c. 8400–8300 BC); 2. large fenced enclosure (c. 8200–8000 BC); 3. stone and clay house (Khirkitia culture, c. 7000 BC).

(Drawings by A. Jesionka).

By 8000 BC, and during the middle and late PPNB, dwellings were built with resistant materials (limestone, hard rocks, mudbricks, clay), and floors were plastered (e.g. Ais Yorkis). Unlike in the Near East, house structures remained circular (Fig. 4.1, 3). Chipped stone industries made of high-quality translucent chert were inspired by PPNB traditions: bidirectional blade production is evident on naviform cores, composite sickles, and tanged projectile points (Byblos points). Stone vessels were made of limestone or volcanic rocks. Obsidian imports reached their peak (several thousand pieces at Akanthou on the northern coast). There is clear evidence for cereal cultivation. Sheep were introduced and exploited for milk, meat, and fur. The

Mesopotamian fallow deer (*Dama mesopotamica*) was transferred to the island and became the main hunting resource. The cat was already tamed. The dead were sometimes grouped together, as in pit 23 at Shillourokambos, but before long individual burials became the standard.

Changes occurred from 7500 BC. Obsidian imports became scarce and opaque cherts from Lefkaran sources were henceforth used to produce robust toolkits (picks, scrapers, and large blades used as sickles). This heralds the last stage of the Cypriot PPN or Khirokitia culture which reached its acme in the seventh millennium (Le Brun 1984, 1989, 1994). The eponymous site, located on a hillock, is enclosed by defensive walls. Stone vessels remained in use whilst pottery, which is widespread on the continent, was still ignored. Agriculture was based on einkorn, emmer, lentils, and to a lesser extent barley. Figs and olives were gathered. Goats, sheep, and pigs were the main meat sources, whilst cattle have more or less disappeared. Some sites (e.g. Cap Andreas Kastros) specialized in fishing for coastal (grouper, porgies) or seasonally migratory species (tuna).

The Khirokitia culture disappeared at the beginning of the sixth millennium or even from as early as the second half of the seventh millennium. This may be related to environmental crises at around 6200 BC, leading to subsequent aridification in the Near East. Population decreased markedly, not recovering until the fifth millennium with the development of the ceramic Neolithic Sotira culture.

THE CHARACTERISTICS OF THE NEOLITHIC DIFFUSION IN THE MEDITERRANEAN: SOME THEORETICAL CONSIDERATIONS

Whereas the Neolithic colonization of Cyprus was early, the spread into the Aegean basin did not begin until the seventh millennium BC. This expansion raises the more general question as to why the Neolithic spread out of the Levantine region in the first place. There have been various hypotheses, none of which are totally satisfactory:

- The demographic pressure hypothesis—the strong increase in birth rates ensuing from village-based life and the adoption of agriculture resulted in too many mouths to feed and evacuation to neighbouring regions. The slowness of this initial spread (there are 2,000 years between the early PPNB, the main phase of domestication, and the appearance of the Neolithic in Thessaly) leaves this proposal unconvincing.
- The social stress hypothesis—the PPNB would have created differences in social status amongst Levantine communities. In order to avoid an overly

rigid hierarchical society, the Neolithic colonizers escaped to a more egalitarian social system. It is impossible to verify this although there is hardly any evidence for very large Levantine settlements in the earliest Mediterranean Neolithic. It is also difficult to consider its ideological implications, although early farmers, strong in their new economic system and its attached values, could have spread it in a kind of religious proselytism (Cauvin 1994).

- The environmental hypothesis—climatic deterioration c. 6200 BC would have destabilized Near-Eastern PPNB populations and favoured a return to earlier mobility patterns and the practice of pastoralism (cf. Ain Ghazal during the PPNC/Yarmoukian transition). Some authors (Weninger et al. 2006) consider that the climatic crises would have forced populations to emigrate to Anatolia and Europe, but this is problematic. The radiocarbon dates seem to indicate that Neolithic communities were already established in south-east Europe by 6200 BC; therefore the climatic reversal is more likely to have disturbed a migration process which had already begun than to be the cause of it. On the other hand, it is attested that this event considerably weakened the last hunter-gatherer populations in the central and western Mediterranean. From Greece to the Iberian peninsula, evidence from stratified cave and rock shelter sites show a lack of deposits between the levels of the final Mesolithic and those of the first Neolithic (Biagi and Spataro 2000; Berger and Guilaine 2006). These gaps occur regularly over the last centuries of the seventh millennium, at the moment when Neolithic groups arrive in western mainland Greece and begin the colonization of the western Mediterranean. Could this deterioration in climate have forced autochthonous populations in the western Mediterranean to return to increased mobility or to split into very small groups? Or did erosion destroy a number of final Mesolithic sites? That these layers are not found in southern Italy, Sicily, Sardinia, Corsica, and from Catalonia and Andalusia, renders the analysis of possible acculturation processes of the local populations and the possible Mesolithic heritage of first village communities very difficult.

Further discussion is concerned with the characteristics of this diffusion. By contrast to the process of regular advance at 1 km/year proposed by A. Ammerman and L. Cavalli Sforza, there is the model of 'arrhythmic' propagation, characterized by sudden diffusions and marked by breaks activating further rapid expansions (Guilaine 2003) (Fig. 4.2). The breaks correspond to areas where a culture reaches the limits of its capacity for expansion and declines. Evolutionary processes and the establishment of new cultural units then follow. Once the new culture is established, a rapid spread of characteristic features and production technologies to new areas occurs. Several cultural boundaries corresponding to this process of cultural transformation can be observed: in central-western Anatolia (the expansion limit of the PPNB), in the Danube region (Starčevo/Linear Pottery culture transition), in western Greece (Initial Neolithic/Impressed Ware groups), and across the North European Plain

(between the Linear Pottery culture/successor Linear cultures/Funnel Beaker culture). In the Mediterranean, maritime colonization may complicate the model, as it can be discontinuous, selective, or leapfrog areas ([Zeder 2008](#)). From south Italy to central Portugal, the speed of propagation seems to exceed 4km/year (2800km of coastline in the 600–700 years between 6000 and 5400 BC).

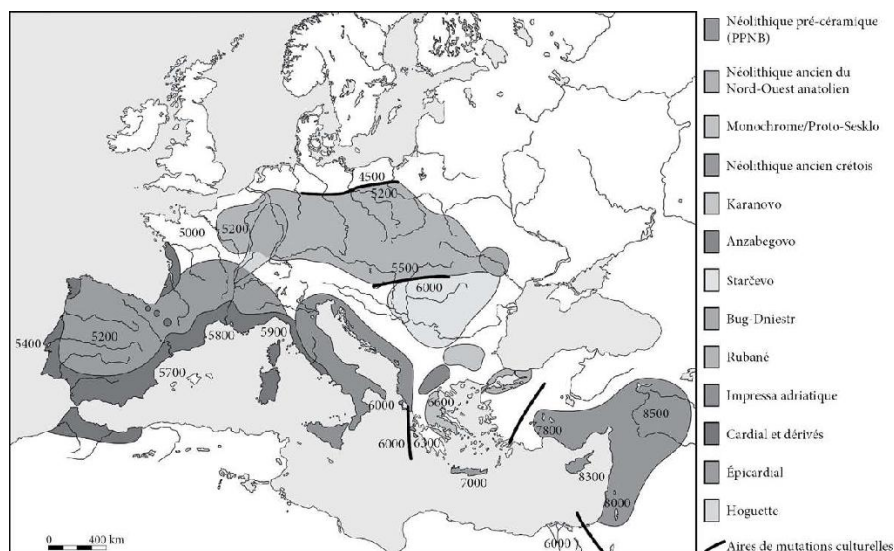


FIG. 4.2. Map showing the ‘arrhythmic’ diffusion of agriculture throughout Europe. The dates indicate the first appearance of agro-pastoralism in a given region. The black lines show the main cultural boundaries, corresponding to temporary breaks during propagation and the re-foundation of new cultures.

FROM ASIA TO EUROPE

The emergence of the Neolithic in Greece is highly determined by the nature of its landscape. The geographical pattern of the Aegean—important mountain ranges and small plains, indented coasts, scattered islands—is predisposed for maritime contact and cultural diversification. During the early Neolithic (6500–5800 BC), Thessaly was the most densely populated region. A full agro-pastoral economy based on the cultivation of wheat, barley, peas, and lentils and on the herding of ungulates was established in this area. All these species are foreign to the local environment and must have been introduced from areas farther east. The hypothesis of an aceramic Neolithic ([Theocharis 1973](#)) is no longer relevant ([Reingruber 2008](#)).

Diffusion routes are a problem. Some cultural features seem to be related to Anatolia: the monochrome/painted ware sequence observed at Çatal Höyük and in the lake district of the Anatolian plateau is

reformulated in Greece, and repetition is indicated by the presence of some stone vessels, bone hooks, pintaderas, and seated figurines. However, evidence for early Neolithic occupation is lacking in Greek Thrace and Macedonia, areas situated on the way between Anatolia and Thessaly. The only site with early Neolithic layers is Hoca Çesme in the European part of Turkey (Özdoğan and Başgelen 1999). One has to suspect maritime influx, probably promoted by previous diffusion networks. Some authors emphasize direct Levantine parallels; for instance, connections have been established between the Greek figurines with ‘coffee bean’ eyes and those of the Yarmoukian in Palestine, a culture dated to the second half of the seventh millennium (Perlès 2003). Archaeobotanists also mention sub-Levantine influences regarding the diffusion of crop cultivation to Cyprus and the Aegean (Colledge 2001; Colledge in Peltenburg and Wasse 2004).

Nevertheless, a number of characteristic cultural features in the Aegean region differed from Anatolia and the Near East. Thus, the PPNB projectile points were replaced by arrowheads of Mesolithic tradition as shown by the Franchthi cave sequence. The origin of the blade industry typical of the first Greek Neolithic is unknown. Settlements of clustered houses (observed in the Anatolian villages of Asikli and Çatal Höyük) were now replaced by villages with free-standing houses (e.g. Nea Nikomedia). Large Near-Eastern style villages or ceremonial buildings did not exist in Greece. Cremation burials (e.g. Soufli Magoula) appeared. Even if Anatolian and Levantine impulses are obvious, they remain selective, diversified, and clearly set apart from the parent area on the basis of local heritages, cultural re-foundations, and processes of regionalization.

THE SOUTHERN AEGEAN

The Mesolithic is virtually non-existent in Thessaly (apart from Theopetra cave located on its western fringes), but this period is better represented in southern Greece, for instance in the Peloponnese (Franchthi, Klisoura, Zaimis), the Cycladic islands (Maroulas on Kythnos), and the Sporadic islands (Cyclops cave on Youra). It is also found in western Greece (Sidari). These sites provide a better understanding of the Mesolithic/Neolithic transition. Thus, at Maroulas paved round houses evoke PPNA or Cypriot patterns, and at Youra goats and small suids maybe indicate possible ‘pre-domestic’ herding, known in Cyprus in the tenth to ninth millennia BC (Kozłowski 2007). These facts speak of maritime contact between the PPN Orient and the Aegean ‘Mesolithic’.

At Franchthi, an aceramic level, described as ‘initial Neolithic’ and

dated to the beginning of the seventh millennium, lies between the last Mesolithic and the first Neolithic occupations: gathering of wild plants and mollusc consumption are associated with emmer and barley cultivation and ovicaprine herding. The lithic assemblage (notched pieces, side scrapers, denticulates) remains partially in the previous tradition, but is enriched by trapezes and blades. A fully developed early Neolithic with pottery follows this level (Perlès 1990).

The Cretan case is similarly particular. There is some evidence for Mesolithic occupation in the southern part of this island. A food-producing economy appears about 7000 BC in the deepest layer of the Knossos sequence (stratum X, Evans 1964; layer 39, Efstratiou et al. 2004), the only early Neolithic site on the island: wheat, barley, and pea cultivation alongside sheep, pig, and cattle herding indicate it was fully developed, with hunting activities completely absent. This farming economy is clearly introduced from outside the island (Broodbank and Strasser 1991). Domestic dogs were present. The lithic artefacts, made of local material or of obsidian from Melos, are of little diagnostic value. Bone spatulas are recorded. Pottery is absent. Child burials were placed in the deepest level. The surrounding landscape was of oak forests along with pines, cypress, almond trees, and ashes associated with shrubs.

The development subsequent to the aceramic layer is difficult to understand. Evans attributed levels IX–IV of his excavation to the early Neolithic and created a subdivision between ENI and ENII (Evans 1964). By that time, constructions of fired mudbrick (a technique introduced externally), various pottery wares, and figurines appeared. Pottery of the earliest horizon (ENI) consists mainly of bowls, carinated bowls, sometimes with offset rims, short-necked spherical vessels, straight profiled bowls, small dishes, and pedestalled bowls, with trumpet lugs, ribbon handles, or triangular ears. Decoration is made of mouldings, dot-impressed triangles or bands, and incised motifs. This pottery has no clear affinities with that of the early Neolithic in mainland Greece or in the central Mediterranean and sophisticated shapes and decoration suggest a more probable middle Neolithic date. Recent radiocarbon dates from the Efstratiou excavations apparently confirm this: they show a real gap of only sporadic and short-lasting occupation between this aceramic level (c. 7000 BC) and the first pottery levels (dated to the mid sixth millennium). Hence, an important element of Evans' 'Early Neolithic' is in fact middle Neolithic, and early Neolithic pottery on Crete remains ill-defined.

The stratified site of Sidari on Corfu, off the Adriatic coast in north-western Greece, offers a very different view (e.g. Sordinas 1969). The sequence starts in the late Mesolithic with a flake industry without

real geometrics and dedicated to the exploitation of marine resources. Recent dating points to the first half of the seventh millennium BC. This layer is immediately followed by another with an identical lithic tradition, but with coarse pottery, sometimes with incised decoration, and the remains of ovicaprids. New radiocarbon dates place this occupation around 6400–6200 BC. It therefore seems that hunter-gatherers had adopted selected Neolithic features. Above a sterile deposit (perhaps corresponding to the 6200 BC event) an early Neolithic occupation with Adriatic Impressed Ware developed.

THE NEOLITHIZATION OF THE CENTRAL MEDITERRANEAN: THE ADRIATIC AND THE ITALIAN PENINSULA

Sidari is a typical frontier site of the ‘arrhythmic’ model. Neolithization started c. 6300 BC, followed by an interlude and the ensuing emergence of the Impressed Ware horizon, which eventually became the vector of Neolithic innovations throughout the Adriatic basin and into the western Mediterranean. The origins of Impressed Ware groups in the central Mediterranean have long been discussed. By 1950, L. Bernabo Brea considered these groups directly related to populations with Impressed Pottery in the northern Levant, appearing from Cilicia to Byblos around 7000 BC. He suggested maritime leapfrog colonization without any stops directly from these areas ([Bernabo Brea 1950](#)). However, this hypothesis is difficult to defend: there is no strict chronological contemporaneity, the pottery styles are different in shape and decoration, and other cultural features (projectile points, houses with stone foundations, etc.) of Near Eastern origin are completely absent in the central Mediterranean. On the contrary, the early Neolithic Adriatic Impressed Ware seems to be a local development based on influences from the neighbouring Aegean area. The transmission of an agro-pastoral economy (emmer, einkorn, hard wheat, barley, sheep, goat, cattle, pig) to the southern part of the Italian peninsula illustrates an integrated or selective package which is well-documented in the Aegean region. Early Neolithic Impressed Ware arose as a cultural standard on both sides of the Otranto channel, formerly divided during the Mesolithic into an eastern area with small-sized flake industries lacking microburins and geometrics, and a south-eastern Italian area with trapeze industries with Castelnovian affinities (Martini in [Tin  1996](#)). This division of hunter-gatherer groups may also be based on economic divergence. Yet the development of crop cultivation and stock-breeding, the use of pottery, and village-based life were to become widespread on both

sides of the Adriatic basin from 6000–5900 BC. Dispersal displays a slow rhythm of expansion from south to north, from Albania to Dalmatia on the eastern side (Müller 1994; Forenbaher and Miracle 2005), and from Puglia to the Marche on the Italian side. To the west, this first expansion also reached Sicily.

The evolution of this first Adriatic Neolithic is emphasized by pottery. Several impressed or incised regional pottery groups developed, characterized by the progressive use of scratching ('tremolo', 'graffite') or painting (Tin  1983). In southern Italy there was a sequence from archaic impressed ware (Fig. 4.3, 1), to Guadone with sophisticated decoration motifs, and then to Lagnano da Piede-Masseria la Quercia, the last two with painted pottery. In middle Neolithic assemblages, painted wares can be associated with high-quality 'figulina' ware: the horizons of white- or red-painted bands (Passo di Corvo, Catignano, Scaloria, Capri), followed by Serra d'Alto and Ripoli wares (Pessina and Tin  2008). At the same time, in Dalmatia, the Danilo group with painted and scratched pottery appears after several stages of Impressed Ware (M ller 1994; Spataro 2002). In Sicily, an initial early Neolithic (the Kronio facies) is replaced by the local Stentinello culture, represented by characteristic impressed pottery which extends to Calabria (Acconia) and Malta (Ghar Dalam) and persists until the fifth millennium (Fig. 4.3, 2).

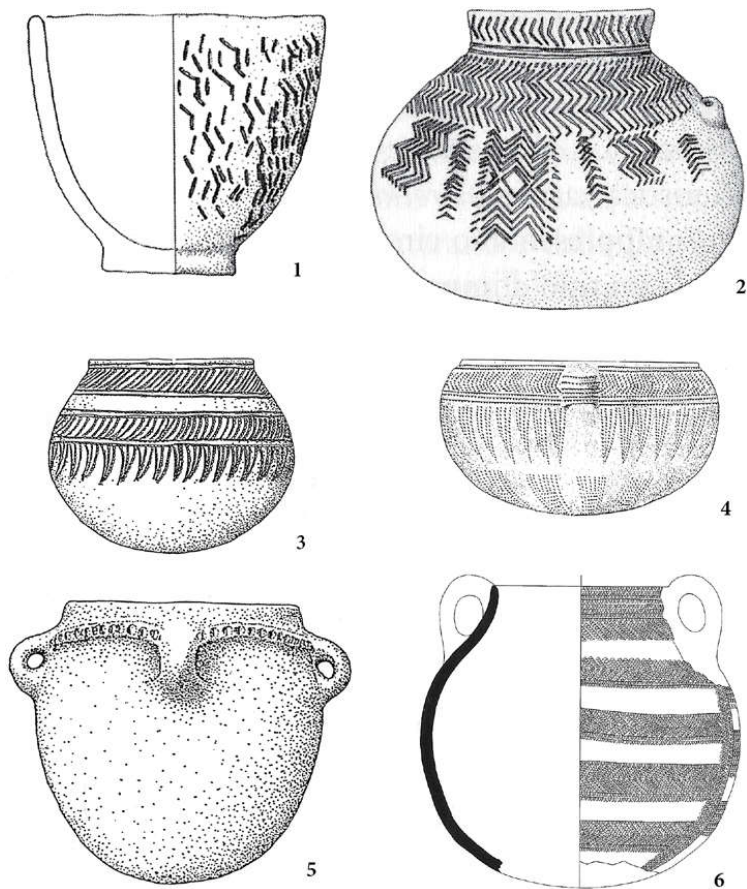


FIG. 4.3. Early Neolithic Impressed Ware of the central and western Mediterranean: 1. Archaic Impressa; 2. Stentinello; 3–6. Cardial.

To the north, on the islands of the Tyrrhenian Sea (Sardinia, Corsica) and on the mainland (Latium, Umbria, Tuscany), the early Neolithic is represented by ceramics with shell-impressed dentellated horizontal and vertical lines (Filiestru, Basi, Pienza) ([Trump 1983](#); [Fugazzola Delpino et al. 2002](#)). Subsequent middle Neolithic pottery groups (Sasso, Sarteano, Monte Venere, Bonu Ighinu) are characterized by cups, bowls, spherical or necked vessels, and incised or grooved decoration. In Liguria, an original early Neolithic horizon can be distinguished by various impressed decorations and chiefly the ‘stab and drag’ motif (Arene Candide cave) ([Maggi 1997](#); [Tin  1999](#)). In northern Italy, a number of early Neolithic cultural facies developed, characterized by limited distribution and regionalism (Vh , Gaban, Fagnigola, Isolino, Vlaška). One of those, the Fiorano group, is more expansive and extends from Emilia to Romagna and Venetia; the pottery shapes (handled cups, bottles) and the decorations (discontinuous lines, dot impressions) recall traits from

the Sasso and Sarteano groups. The broad latitude of the Italian Peninsula, the variety of influences, and local creativity explain this amazing variability of cultural groups, which continued into middle and late Neolithic times.

The first settlements in south-east Italy were densely distributed (180 in the Tavoliere area alone). In general, sites are small, ranging from 0.5 to 2ha, open or surrounded by one or two ditches enclosing a 'farmstead'. During the early Neolithic, a large number of settlements are found dispersed, for example along the Ofanto valley between the Tavoliere and the Murge. In the middle Neolithic, settlements become larger and can now be described as 'villages' (Passo di Corvo) with numerous C-shaped enclosures forming 'compounds' (Tin  1983; Jones 1987). Habitation structures are poorly known. They are sub-rectangular (7–12 by 4–4.5m) and built with wood and daub (Rendina, Balsignano). In the south, marked settlement is shown by enclosure or terrace walls (Molfetta, Capo Alfiere), circular enclosures with massive walls for penning animals (Trasano), hearth structures, storage pits, and other structural features. The distribution of raw materials (flint from the Iblei mountains in Sicily, from the Gargano and La Defensola mines, or from the Lessini mountains near Verona, and obsidian from Lipari, from the Pontic islands, or from Mount Arci in Sardinia) stresses the importance of large-scale circulation from the start of the Neolithic (Galiberti 2005; Barfield in Pessina and Muscio 2000; Tykot 1992). Meat production was almost exclusively based on herding, especially cattle, although ovicaprids dominate numerically (Torre Sabea) (Guilaine and Cremonesi 2003). Intra-mural burials are isolated and scarce. With its numerous cremation burials, the Continenza cave (Abruzzo) constitutes an exceptional case. Figurines are poorly represented during the early Neolithic.

THE WESTERN MEDITERRANEAN

Broadly speaking, there are two opposing approaches to the Neolithization of this area: 1) that the Cardial, or first Neolithic, was established by maritime colonization from Italian sources, introducing the village, crop cultivation, stock breeding, polished stone tools, pottery, and a new ideology as an integrated package; 2) the Cardial represents the acculturation of hunter-gatherers who adopted the Neolithic way of life and food-producing techniques from the Italian area whilst retaining their cultural heritage and own creativity. In recent years, research has considerably complicated the controversy, and possible interactions between local hunter-gatherers and external introduction has been revisited.

The final Mesolithic of the western Mediterranean is characterized by a good knowledge of flint sources, production of regular blades, the use of the microburin technique, and trapezoidal and triangular microliths. Technical markers distinguish between the western Castelnovian centred on Provence, and along the Rhone and the western Alps (there is also an eastern Castelnovian in north-east Italy); the 'Gazel-Cuzoul' group in western Languedoc, the Pyrenees and Aquitania; the 'Lower Ebro valley group'; the 'Cocinian' group in the Valencia/Alicante region; and the 'Concheiros complex' of Muge in Portugal (Guilaine and Manen 2007). The other regions are poorly documented. Red deer, boar, and roe deer were hunted, with ibex also stalked, particularly in high mountain areas. Plant gathering (*Fabaceae*, *lens* sp., *Vicia*, *lathyrus*, blackberries, sloes) is attested. Most radiocarbon dates corresponding to this late Mesolithic are clustered between 6600 and 6000 BC. A number of studies, chiefly of the Iberian Peninsula, suggest the subsequent progressive conversion of hunters to a food-producing economy, completed by the mid-sixth millennium. This is the 'dual' model (Juan Cabanilles and Marti 2002).

The first Neolithic features in southern France are introduced c. 5700–5600 BC by small pre-Cardial groups, a kind of maritime 'colonizer' originating from Italy. They founded small, short-lived settlements related to the pioneer farming of the coastal environment. The pottery styles (flat-based vessels, bowls, cooking pots, and bottles with impressed, grooved, and incised decoration) show stylistic links to southern and central Italy, and there are affinities with the Ligurian Impressed Ware of the Arene Candide type. Subsistence strategies were mainly based on crop cultivation (einkorn, emmer, barley) and stock-breeding (sheep and more particularly cattle). Hunting was almost absent. Obsidian imports came from Sardinia and Palmarola. Three sites are well documented: Pont de Roque Haute and Peiro Signado at Portiragnes (Hérault), and the lower layer of the Pendimoun shelter at Castellar (Alpes-Maritimes). These small open-air settlements were probably simple 'farmsteads' like the first Neolithic settlements in southeast Italy (Guilaine et al. 2007). Italian links have also recently been discovered in the Valencia area (Spain).

After this first chronological stage, the 'Franco-Iberian' Cardial follows from about 5500 BC. By now, the Neolithic, formerly restricted to coastal and sub-coastal areas, extended to more continental regions following a fluvial axis (Rhone, Ebro, Genil) to the mountain ranges of the Pyrenees in Andorra and Aragon, and Sierra Nevada in Spain. At the same time, dense coastal settlement appears in Provence, Catalonia, Valencia, Andalusia, and from the Cadiz region to central Portugal (Manen 2000; Van Willigen 2006). The chipped stone industry combines laminary production (sickles, knives) with a flake

industry providing end scrapers or denticulates. Arrowheads can be ubiquitous (trapezes with abrupt retouch) or regionalized (Montclus points and Jean-Cros points in southern France, 'double-bevelled' segments in Spain). From now on, pots were round-based (bowls, globular vessels, bottles), although pointed-base amphorae are also known. Decorations are made of horizontal and vertical shell-impressed bands, and vertical and orthogonal mouldings, sometimes with finger impressions (Bernabeu 1989) (Fig. 4.3, 3–6). What could be a sophisticated bone industry produces spoons and spatulae.

Settlements are often close to water (shores, ponds, rivers, paludal zones), and in some coastal regions, sites could have disappeared due to the versilian marine transgression (Leucate). Settlement organization is not well known. Houses might have been rectangular, built with wood and daub (La Draga, near Gerona) and apsidal (Mas d'Is à Alacant, Alcoy). Close to the latter site were circular pits recalling similar features from south-east Italy (Bernabeu et al. 2003). At the same time, the frequent occupation of caves and rock shelters indicate the importance of pastoralism and hunting in ecological niches. By now, agriculture is particularly based on hard wheat (*Triticum aestivo-compactum*). Yet long-lasting occupation has not been demonstrated. The spread of the 'Franco-Iberian' Cardial from Provence to Portugal may have been rapid. Its origins, however, remain unclear because in southern France it had been preceded by 'impressa' pioneers from Italian countries. Possible Thyrrenian influences (from the slightly older Cardial style present in Sardinia, Corsica, Latium, and Tuscany) cannot be ruled out. On the other hand, the integration of autochthonous Mesolithic populations cannot be totally rejected. Their heritages may be evident in burial traditions, as the few known burials are found in caves, and ornaments (cf. the continuous use of *Columbella rustica* for necklaces).

From 5200 BC, the Cardial is in competition with a culture that originates from it, but which will gradually eliminate it—the Epicardial (Van Willigen 2006). Spanning an area from the Rhone basin to Andalusia, the Epicardial shows a stronger expansion than the Cardial, with various pottery facies (grooves, impressed bands, parallel lines, garlands) and several chronological stages. In France, it extends to the western Alpine range, the Causses, and the Aquitanian fringes of the Massif Central. Colonization in the Iberian Peninsula is mainly across the central plateaus. Open-air settlement increases and storage pits show the importance of agricultural activities. About 4500 BC, the Epicardial splits into several distinct facies (Fagien, Montbolo, Molinot, etc.) and signals the transition to the middle Neolithic.

So far, no impressed or Cardial pottery is known from the Balearic Islands. Prehistoric hunting expeditions may have caused the

extinction of *Myotragus balearicus*, an endemic antelope, although natural conditions could also have been responsible. The first farmers were established on Majorca at c. 4000 BC. No human presence is noted in Minorca before the third millennium.

When the Neolithic established itself in southern France and the Iberian Peninsula with the emergence of Impressed Ware and Cardial settlements, it had already lost an important part of the cultural features originally present in the Near-Eastern PPNB. These western areas lack large villages, cemeteries, evident social differentiation, or an interest in figurines for domestic or religious practice (Table 4.1). All these characteristics only appear several hundred years later.

Table 4.1 Differences between the first eastern (PPNB) and the western (Impressa/Cardial) Mediterranean Neolithic cultures.	
Near East (PPNB)	Western Mediterranean (Cardial)
Possibility of huge agglomerations (more than 8ha)	Small settlements (less than 1ha to 4ha)
Settlement hierarchy	?
Constructions of heavy (stone) or ‘transformed’ (mudbricks) materials	Use of lighter building materials (wood, daub)
Possibility of cemeteries	No cemeteries
Collective burials in specific buildings	No collective burials
Visible manifestation of burials	Isolated and rare burials
Social stratification developing in the PPNB	No apparent social stratification
Cult buildings	Absence of cult buildings
Anthropomorphic statuary	Absence of anthropomorphic statuary
Abundance of figurines	Rarity or absence of figurines
Stone vessels	Pottery

CONCLUSION

The Neolithization of the Mediterranean was not the single diffusion of a monolithic cultural, economic, and social model. Its spread is characterized by periodic breaks and the cultural transformation of the original model—especially in central Anatolia, then the western Aegean, and finally the western populations of the impressed ceramic family. The early Neolithic of the Mediterranean is therefore not a homogeneous entity but is culturally varied across space.

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CHAPTER 5

CENTRAL AND EASTERN EUROPE

WOLFRAM SCHIER

INTRODUCTION

EVER since Gordon Childe's pioneering syntheses of the Neolithic in south-eastern and central Europe ([Childe 1929](#)), the movement of ideas and/or people has played a crucial role in research on the beginning of the Neolithic. It was soon recognized that wild predecessors of sheep, goat, and domesticated plant species are unknown in central and eastern Europe and were thus introduced. Childe's view of Neolithic colonists migrating from the Near East remained unchallenged until the early 1980s, when a debate was initiated about the contribution of hunter-gatherers to Neolithization. German-speaking archaeology started this discourse a decade later (see 'Demic diffusion or spread of ideas?'), and in eastern Europe migrationist models dominated until the 1990s. Whilst these issues have been debated most widely for the beginning of the Neolithic, they are considered here alongside the later spread and transfer of knowledge, technology, and ideology.

THE SIXTH MILLENNIUM

Neolithization of Central Europe

The first food-producing population of central Europe, expanding into eastern Europe as far as western Ukraine, is archaeologically identifiable as the Linearbandkeramik (LBK). In its earlier phase its distribution stretches from the Rhine to Volynia and from north-western Hungary to central Poland and northern Germany ([Fig. 5.1](#)).

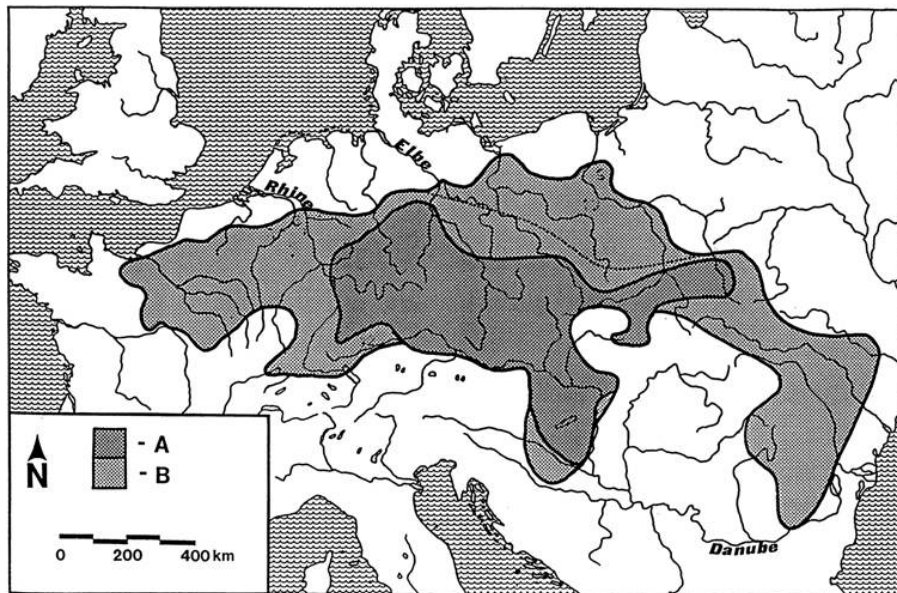


FIG. 5.1. Distribution of earliest LBK, 5500–5300 BC (A) and early to late LBK, 5300–4900 BC (B). The dotted line indicates the northern limit of loess distribution. After [Bogucki 2000](#), [fig. 8.1](#).

For several decades LBK research has been centred in the lower Rhine area, in northern Bohemia, and, increasingly, in the Paris basin. Except for Bohemia, these areas lie outside the core area of the earliest LBK (5600–5300 BC). A large-scale project dedicated to this formative stage of the central European Neolithic, conducted by Lüning between 1983 and 1993 ([Lüning 1988](#); [Kreuz 1990](#); [Gronenborn 1997](#); [Cladders 2001](#); [Stäuble 2005](#)) yielded a lot of new information about settlement, lithic distribution systems, dating, and regional variation of the earliest LBK. It could not, however, solve the question of the origin of LBK longhouses, which, unlike the domesticates, were unknown to the Starčevo–Körös culture of the Carpathian Basin and the Balkan peninsula ([Bánffy 2004](#), 51–71).

As early as 1960, Quitta suggested the hilly region around Lake Balaton, in northern Hungary, as the possible origin of the LBK, since only here could a contact zone with the Starčevo–Körös culture (6000–5400 BC) have existed ([Quitta 1960](#)). Only recently has intensive research and large-scale excavation at the site of Szentgyörgyvölgy–Pityerdomb, south of Lake Balaton, uncovered transitional material combining traits of both the Starčevo and earliest LBK, alongside domestic structures resembling the central parts of LBK longhouses ([Bánffy 2004](#)).

New dates from north-west Hungary agree with the dates for the earliest LBK in the Vienna basin, at Schwanfeld (north Bavaria), or at

Eitzum, 800km north-west of Lake Balaton (Stäuble 2005, 218–260; Lenneis and Stadler 2002). Thus, in contrast to the still popular ‘Wave of Advance’ model (Ammermann and Cavalli-Sforza 1973), no geographical gradient is recognizable in the distribution of dates, suggesting the rapid spread of this new way of life.

Who was First? Earliest Farmers in Western Central Europe

Regardless of the models used to explain their spread, the first domesticated animals (cattle, sheep/goat, pig), cereals (einkorn, emmer, spelt, naked barley), and pulses (pea, lentil) in central Europe are firmly associated with the LBK population. As early as 1982, however, Bakels published the first evidence of a species cultivated by LBK farmers on the Lower Rhine (Bakels 1982) which does not belong to the ‘Neolithic package’ ultimately derived from the Near East—poppy seeds (*Papaver somniferum*).

Their implication was fully grasped only towards the end of that decade, when a new early Neolithic phenomenon was identified in south-west Germany, Alsace, and the Swiss Jura mountains—the La Hoguette group (Lüning et al. 1989), named after finds from the basal layer of a remote megalithic cairn in Normandy (Jeunesse 1987). East of the Rhine, this group occurs almost exclusively as ceramic intrusions in refuse pits of the earliest LBK; west of the Rhine and scattered across Alsace and north-western Switzerland, where no earliest LBK existed, isolated La Hoguette assemblages are known mainly from cave deposits. No houses or camp structures are associated with this group, but there is scant evidence for the keeping of sheep/goat and the cultivation of cereals (Strien and Tillmann 2001). La Hoguette pottery, with its impressed decoration and characteristic bone temper, could have been derived from west Mediterranean Cardial/Epical traditions (Stöckli 1995, 24–25; Gronenborn 1999, 138–140), and since wild poppy has a western Mediterranean home area (Bakels 1982, fig. 1), the La Hoguette farmers were suspected of having brought this cultivated plant of non-oriental origin into western central Europe.

The dating evidence for the La Hoguette group is still rather scant due to the small number of attributable sites, but it pre-dates the earliest LBK. Thus, even two decades after the emergence of La Hoguette in the landscape of Neolithic research, the question remains open as to who were the first farmers along the Upper Rhine, where the rapid expansion of the earliest LBK stalled for two to three centuries. It cannot even be ruled out that the La Hoguette group marks the westernmost end of a northern Eurasian tradition of pottery

using Mesolithic populations.

Demic Diffusion or Spread of Ideas? New Evidence about an Old Debate

Before 1990 the Neolithization of central Europe was mainly seen as the result of colonizing farmers migrating into densely wooded areas. Considering the scarce evidence for late Mesolithic hunter-gatherers in the fertile loess regions, their role and participation in Neolithization appeared negligible. [Sielmann's \(1971\) Ökologiekreis](#) hypothesis, a truly processual model, described the colonization process as an attempt by first farmers to minimize adaptation stress by searching for the ecological conditions most similar to their origin area. [Lüning \(1988\)](#) firmly maintained the colonization hypothesis in a broad synthesis on the LBK, and, using radiocarbon dates, suggested a rapid spread. He considered changes in mentality and society more likely causes than environmental factors.

In the early 1990s the Neolithization debate was resumed with a shift of focus towards the indigenous Mesolithic population. [Tillmann \(1993\)](#) challenged the notion of LBK colonization, emphasizing continuity in lithic technology (mainly the primarily faceted striking platform) between the late Mesolithic and earliest LBK. He observed a different technique of core preparation in La Hoguette assemblages, which he traced back to another Mesolithic tradition of Swiss and southern French origin. Technological continuity in lithic production is thus seen as indicating the indigenous adaptation of a new subsistence strategy.

On a regional scale, [Kind \(1998\)](#), influenced by the 'availability' model of [Zvebil and Rowley-Conwy \(1984, 1986\)](#), argued for coexistence and interaction of earliest LBK, final Mesolithic, and La Hoguette groups in the Upper Neckar valley, south-west Germany. He suggested cultural diffusion and acculturation of indigenous complex hunter-gatherer communities, without completely ruling out immigration of small farming groups.

In central Hungary, [Kertész's \(1996\)](#) intensive fieldwork enabled him to fill some of the gaps in the sparse distribution map of the late Mesolithic in the Carpathian Basin. Consequently, scenarios of Mesolithic acculturation were discussed, both for the formation of the early Neolithic Körös culture ([Chapman 2003](#)) and the genesis of the earliest LBK in north-west Hungary half a millennium later ([Mateiciucová 2004](#)). The 'rediscovery' of the Mesolithic hunter-gatherers thus characterizes the Neolithization debate of the past decade. This shifting paradigm gave rise to a variety of new models attempting to mediate between the migrationist and diffusionist

positions:

- [Gronenborn \(1999, 2003\)](#) develops a three-stage model of LBK expansion involving contact and exchange of raw materials between the earliest farmers and late forager groups and the migration of earliest LBK groups into densely forested areas unattractive to hunter-gatherers. The established exchange relations would have been maintained throughout the earliest LBK phases.
- [Bánffy \(2004\)](#) and [Friedrich \(2005\)](#) emphasize the acculturation of indigenous foragers in north-west Hungary, where they interacted with neighbouring late Starčevo communities, creating the LBK. Its subsequent expansion towards western central Europe, however, is seen as migration. [Friedrich \(2005, 92\)](#) even suggests a continuation of Mesolithic mobility patterns, where the agrarian pioneer settlement replaced the Mesolithic base camp.
- [Lüning \(2007, 178–182\)](#) recently proposed a ‘missionary’ model with only limited immigration and the small-scale acculturation of late hunter-gatherers around the pioneer settlements. This might explain the striking increase of site density in the subsequent Flomborn phase of the LBK (5300–5100 BC).

The multitude and dialectic sequence of Neolithization hypotheses frequently reflects schools and fashions of archaeological thought rather than genuine improvements in archaeological insights ([Scharl 2004, 163–167](#)). The shifting emphasis on the active participation of hunter-gatherers reflects to some extent new data on the Mesolithic in and around the loess belt, but also a post-processual concern for social competition, prestige, and ideology as prime movers.

The Neolithization debate, however, continues. At present, migrationist positions receive fresh support from molecular archaeology. Recent palaeogenetic research on cattle mtDNA ([Bollongino 2006](#)) excludes any European domestication of (female) aurochs (as assumed by [Gamble and Barker 1985](#)) and suggests a descent of Neolithic (and later) cattle from a rather small group of Near Eastern haplotype. Human aDNA extracted from LBK inhumation burials shows very low genetic similarity with modern Europeans, but at the same time also great genetic distance to upper Palaeolithic and Mesolithic aDNA. [Bramanti et al. \(2009\)](#) interpret these new results as strong arguments for the predominant immigration of an early Neolithic population into central Europe.

Another challenge to the traditional view of Neolithic colonization associated with LBK material culture was the notion of pre-LBK small-scale agriculture. Pre-Neolithic cereal cultivation in the Alpine foreland was postulated as early as 1975 ([Kossack and Schmeidl 1974/75](#)) and received additional support in the 1990s ([Erny-Rodmann et al. 1997](#); [Nielsen 2003](#)). Based exclusively on pollen evidence, [Gehlen and Schön \(2003, 266–269\)](#) assumed experimental cereal cultivation in the early sixth and even seventh millennium BC.

However, most of this alleged evidence for Mesolithic cereal cultivation comes from sub-alpine or other mountainous environments beyond the loess belt and outside the core area of early Neolithic settlement, regions for which a genuine Neolithic economy is unknown before the end of the fifth millennium. They thus antedate regional Neolithic sites by two millennia.

In a recent critical survey and re-evaluation of supposed pioneering Mesolithic agriculture, [Behre \(2007\)](#) refutes the concept in its entirety. Underlining the methodological difficulties in unambiguously identifying cereal pollen, he criticizes those archaeologists who misinterpret the archaeobotanical term '*cerealia type*' as putative evidence for cultigens, and points out that only dated cereal macrofossils should be taken as clear evidence for early agriculture.

Thus at present, absolute dating, new palaeogenetic results, and the critical examination of archaeobotanical data tend to support the introduction of a Neolithic economy into central Europe by demic diffusion at around 5600 BC. Nevertheless, the debate of the 1990s sensitized present-day archaeology to interaction between hunter-gatherers and early farmers and prepared the way for more complex models of Neolithization which integrate migration (of farmers) and acculturation (of foragers).

‘Wave of Advance’ or ‘Stop-and-Go’ Model?

The still popular ‘Wave of Advance’ model for the spread of a Neolithic way of life ([Ammermann and Cavalli-Sforza 1973](#)) is a misleading oversimplification for central, south-eastern, and eastern Europe (see [Zvelebil and Lillie 2000](#), 60–64 for a substantial critique). When looking at the chronological data, its geographical distribution, and cultural attribution in greater detail, it is obvious that Neolithization consists not of steady progress, but, on the contrary, alternate episodes of very fast spread and stagnation. Guilaine (this [volume](#)) recently coined the term '*hypothèse arythmique*' for this phenomenon. Thus, the early Neolithic Starčevo–Körös–Criș culture area for centuries maintained a northern boundary zone running from Slavonia and central Transdanubia eastwards across the Tisza region far into south-eastern Transylvania and southern Moldova. The earliest LBK expansion, starting from north-western Hungary and western Slovakia around 5600 BC, did not cross its western boundary at the river Rhine, where there was probably contact or competition with La Hoguette farmers, for two to three centuries. It was only between 5250 and 5000 BC that the LBK quickly attained its maximum distribution into northern France, eastern Romania, Moldavia, and western Ukraine.

THE FIFTH MILLENNIUM

One of the most puzzling features of the European Neolithization process is that the geographical boundaries established around 4950 BC were maintained by and large until about 4400 BC (see ‘Beyond the loess belt’). During this long period, Neolithic life was firmly established throughout the central European loess belt, with material culture and settlement topography showing a high degree of continuity at both micro and macro scales. Regional discontinuity, as in the Rhineland after the end of the LBK, is an exception rather than the rule, with other regions like central Germany, Bavaria, Lower Austria, southern Poland, Bohemia, Moravia, or Hungary having no cultural gap separating the early from the middle Neolithic.

The Spread of the Solar Calendar—Monumentalizing Astronomic Knowledge

Whilst there is no evidence for the large-scale movement of people or the introduction of new cultigens during the first half of the fifth millennium, we observe a widespread ideological innovation connected with a new type of architecture, the circular enclosure (*Kreisgrabenanlage*). As described in greater detail by [Petrasch](#) (this volume), this henge-like type of monument, consisting of deep V-shaped ditches, one or several circular palisades, and three to six entrances, is known from Hungary, western Slovakia, eastern Austria, the Czech Republic, and southern and central Germany. More than 120 have been documented by aerial photography and geophysical prospecting, but only a few have been excavated ([Trnka 2005](#); [Neubauer 2007](#); [Schmoltz 2007](#); [Řídký 2011](#)). Their dates cluster around 4900–4700 BC, indicating they were a short-lived phenomenon or ‘fashion’ with a very specific distribution. Recent archaeo-astronomical research has demonstrated the precise orientation of their entrances towards calendrical turning points in the solar year, such as the position of sunrise or sunset at the solstices or equinoxes. At the Bavarian site of Ippesheim, Neolithic observers were able to determine the precise day of the winter and summer solstice by plotting along the right entrance post towards two prominent landmarks a few kilometres away with an accuracy of a few arc minutes ([Fig. 5.2](#); [Schier and Schmidt-Kaler 2008](#), 50–52). Similar astronomical accuracy could be achieved at the central German site of Goseck ([Bertemes and Schlosser 2004](#)), the elliptical enclosure at Meisterthal (Bavaria; [Becker and Kreiner 1993](#)), or the Austrian sites of Puch, Steinabrunn, and Immendorf ([Zotti 2005](#); [Kastowski et al.](#)

2005).

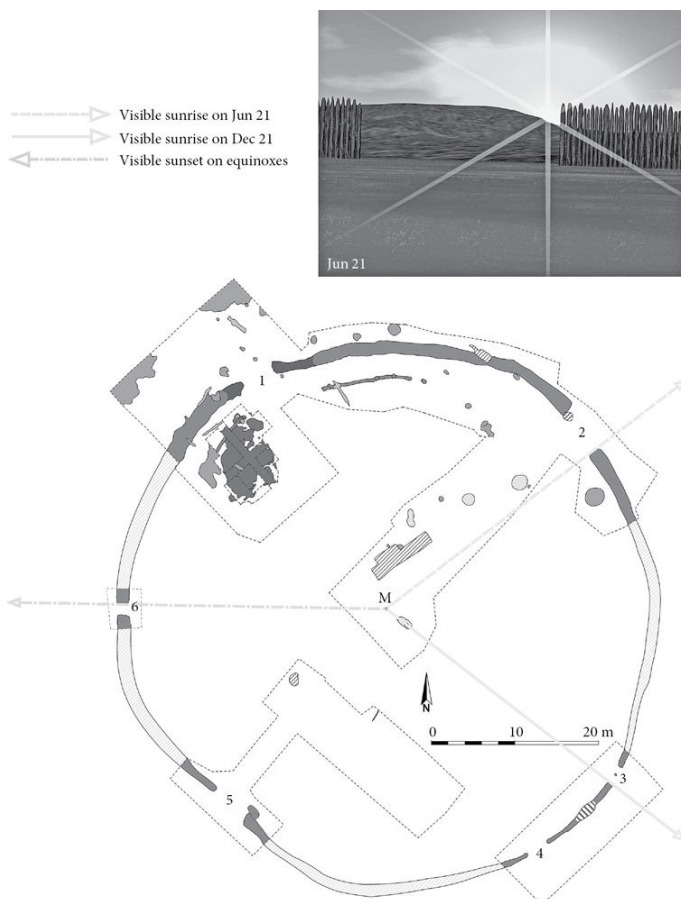


FIG. 5.2. Circular enclosure at Ippesheim, Bavaria, c. 4900–4800 BC. Graphic S. Suhrbier and W. Schier.

There is little reason to assume these circular enclosures were nothing more than ‘monumental calendars’ for timing agricultural activities, as has sometimes been proposed. Agriculture functioned well in central Europe half a millennium earlier and long after these manifestations of astronomical knowledge. Currently, multifunctional interpretations are favoured, their astronomical orientations relating to cyclical rituals (initiation? fertility?) and cosmological symbolism (Stäuble 2003, 2007; Neubauer 2007, 222–236; Bertemes and Northe 2012, 35–38).

The astronomical orientation of enclosure entrances has often been suggested, but could be verified only at a minority of sites up to now. Nevertheless, we may tentatively associate the appearance of very similar complex monuments over a large area and within a short time span with the spread of something like a solar ideology. The striking

accuracy of astronomical observation and the exact location of sites in relation to landmarks visible from their entrances at turning points of the solar year suggest that the solar calendar was already known, at least to specialists. The astronomical expertise with at least some of the circular enclosures might have had symbolic and prestigious value for a small segment of Neolithic society, whose members staged and performed their knowledge in impressive and monumental architecture.

Beyond the Loess Belt—Discovering Wetlands in Western Central Europe

The forty-fourth and forty-third centuries in central Europe saw considerable change in material culture (gradual decline of pottery decoration, new lithic technology), the disappearance of longhouses, and the expansion of the Neolithic beyond the loess zone, the preferred habitat since the earliest LBK. The first bog and lakeside dwellings on the Swiss plateau (Zürich-Kleiner Hafner layer 5A-C, [Gross-Klee and Eberli 1997](#), 22; Egolzwil 3, [Stöckli 1995](#), 22) and in south-west Germany (Aichbühl, [Strobel 1998](#); [Schröter 2009](#)) appear between 4425 and 4275 BC ([Menotti](#), this volume). Their house types and settlement structure are completely different from the middle Neolithic Stichband, Großgartach, and Rössen cultures. The number of bog and lakeside settlements in the northern Alpine foreland is small until around 4000 BC, but grows rapidly in the first third of the fourth millennium. For the morainic landscapes between the Upper Danube and the Swiss plateau, this dynamic settlement process can be compared to a Neolithic *landnam* episode, filling the empty spaces between the few isolated regions already settled during the middle Neolithic.

The causes of the large-scale expansion of the central European Neolithic economic area are still unclear. In terms of economy and settlement, this period of change is characterized by diversification: the range of environmental parameters defining preferred settlement locations broadens dramatically, leading to a coexistence of, and interaction between, settlement systems in quite different habitats ([Schier 1993](#)). The fertile loess and alluvial soils in the basins, river valleys, and lowlands of central Europe were not abandoned, but wetlands and morainic landscapes complemented the range of agriculturally exploitable habitats. A recent study suggests that this broadening of the habitat range required new agricultural technologies, among which fire-based extensive cultivation (slash-and-burn) might have played an important role ([Schier 2009](#)). It is assumed that early Neolithic ‘intensive garden cultivation’ ([Bogaard](#)

2004), adapted to optimal soil and climatic conditions, was not suitable for cooler and moister habitats and soils less well equipped with nutrients (Schier 2009, 32–37).

At present it is unresolved if this far-reaching expansion of the Neolithic way of life was caused by demographic growth, population movement, or the spread of new agricultural techniques enabling cultivation of the wetland zone. Neither can it be ruled out that surviving hunter-gatherer communities, well adapted to wetland conditions, played an active role in the spatial expansion of the Neolithic economy in the later fifth millennium.

In eastern central Europe, there was no comparable shift towards wetlands, and there are no extensive morainic landscapes or lakes and bogs of glacial origin. But in the last third of the fifth millennium there is nonetheless change. In southern Poland, Slovakia, Moravia, north-west Hungary, and eastern Austria the extensive Lengyel culture is followed by regional Epilengyel groups, whilst settlement patterns show an increasing concern for hilltop locations. In eastern Hungary, the Eneolithic Tiszapolgár culture puts an end to the late Neolithic tell settlement tradition (Link 2006, 43–51). In contrast to its abundant burials (Bognár-Kutzian 1972), the settlement evidence is still rather scant.

Underlying these patterns of change was the innovation of copper metallurgy spreading along a geographical gradient from south-east to north-west. Since this new technology is treated elsewhere (Heyd and Walker, this volume), it suffices to note the coincidence between its spread and the evident changes in settlement and habitat exploitation. The density of copper finds in eastern central Europe, especially north of the Carpathian Basin, is many times higher than in the west, where the few copper artefacts dating to earlier than 4000 BC nevertheless indicate exchange relations with the early production centres in Hungary, Slovakia, and further east.

THE FOURTH MILLENNIUM

During the first half of the fourth millennium, bog and lakeside settlement is a widespread phenomenon between the Austrian Alpine foothills (Mondsee), the Upper Danube, and Lake Geneva. Lake Constance, Lake Zürich, and the three Swiss Jura lakes (lakes Biel, Murat, and Neuchâtel) are especially densely lined with lakeside settlements (Menotti, this volume). From east to west, these settlements can be attributed to the Mondsee, Altheim, Pfyn, and Cortaillod culture groups. Only the Altheim culture is also known from settlements and enclosures on dry mineral soils. North of this

pre-Alpine zone, western central Europe is dominated by the Michelsberg culture, archaeologically most present in its monumental enclosures. Its settlement evidence is sparse and house remains almost completely lacking.

Crowded Shores and Empty Lowlands—Large-scale Settlement Heterogeneity in the Later Fourth Millennium

After an interruption of roughly two centuries, due to widespread lake transgressions, dense settlement along the pre-Alpine lakes resumed between Lake Constance and the French Jura mountains in association with the Horgen culture (3400–2800 BC). Most of southern Germany, however, appears almost empty of settlement or burial evidence during the second half of the fourth millennium ([Preuß 1996](#), map 7). Taking this at face value, an area of more than 200,000km² would have stayed almost uninhabited for 500 years. Since neighbouring areas to the south (Horgen culture) and north (Wartberg and Bernburg cultures) are well represented in the archaeological record, and the North European Plain is full of megalithic burials mostly dating to this period, depopulation or even emigration seems unlikely. More probably, large-scale taphonomic biases are responsible for the lack of sites (e.g. a widespread preference for log building, which would leave no postholes, the absence of storage and refuse pits, and the lack of archaeologically visible burial customs).

In eastern central Europe, site density increases. The most widespread phenomenon here is the Baden culture, centred in the north-western Carpathian Basin. Together with its related groups (Jevišovice, Bošáca, Bisamberg-Oberpullendorf), its distribution encompasses Hungary, eastern Austria, Moravia, Bohemia, western Slovakia, and Little Poland. Its regional and chronological differentiation has recently been re-analysed by [Furholt \(2009\)](#). Settlement locations vary considerably, and in Moravia and Bohemia a certain preference for hilltop settlements can be observed. Generally, these sites consist of pits and ditches, but structural remains of houses are rare.

Wheel and Wagon—Age and Origin of a Neolithic Innovation

Probably the most momentous and debated innovation of the European Neolithic, apart from Neolithization itself, is wheeled transport. The development of ever more accurate chronologies and a number of new finds have considerably changed the factual evidence

during the last two decades. Whilst [Childe \(1951\)](#) and [Piggott \(1983\)](#) supposed an oriental origin of both wheel and wagon, present opinions are quite diverse. The archaeological evidence for wheeled transport falls into three categories: (a) finds of full-size wheels with traces of use; (b) depictions or models of wheels, wagons, or draught animals; (c) preserved traces of wheels.

Over the last two decades, more than 20 wooden wheels dating to the late and final Neolithic have been discovered in wetland contexts in central Europe. At present, one of the oldest wheels in central Europe, and apparently worldwide, comes from a bog settlement at Stare Gmajne, near the Slovenian capital Ljubljana. It was found, together with an axle, at the base of a burnt layer belonging to the local phase Ljubljansko barje III/IV ([Velušček 2009](#)). Two AMS dates of the wheel and axle were calibrated at 3360–3090 BC. Roughly contemporary is a complete wooden wheel from Zürich Pressehaus, without clear stratigraphic context, but attributed to the Horgen culture ([Höneisen 1989](#), 18). At the Federsee bog in south-west Germany, the oldest of several wooden wheels was found at Seekirch-Stockwiesen, dated 3000–2900 BC, also belonging to the Horgen culture ([Schlichtherle 2004](#), 297). Much more numerous are the wheel finds of the twenty-eighth to twenty-sixth centuries associated with the Corded Ware culture and the regional Goldberg III group ([Fig. 5.3](#)).

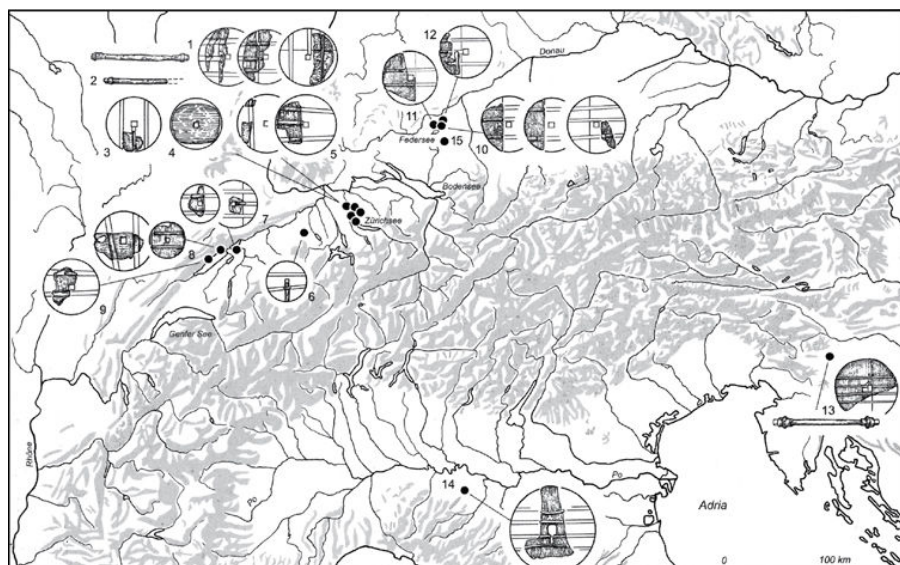


FIG. 5.3. Wheels and wagon parts in the circumalpine region 3500–2500 BC: 1–5 Zürich; 6 Egolzwil II; 7 Vinelz; 8 Saint Blaise; 9 Auvernier; 10, 12 Seekirch; 11 Alleshausen; 13 Stare gmajne; 14 Castioni de' Marchesi; 15 Olzreuter Ried. After [Schlichtherle 2004](#), abb. 2.

With the exception of the wheel from Zürich Pressehaus, cut from a single piece of wood, all other Neolithic wooden wheels of the circumalpine area are manufactured in the same way. They consist of three separate wooden planks fitted together and fixed with two or three transversal strips inserted into dovetailed grooves (Fig. 5.4, 1–2). The axle was fixed in a square central hole, thus turning with the wheel under the wagon. The wheel was usually made from maple wood, with ash used for the strips and the axle. The carpentry details are very specific and at the same time widespread, suggesting a single ‘construction manual’ passed on or taught throughout the whole region and maintained over at least five centuries without visible alterations.

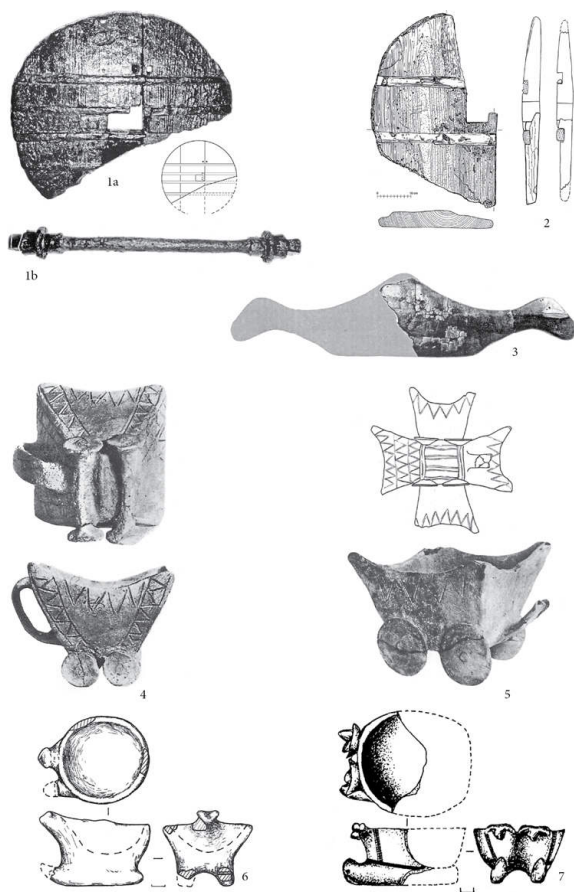


FIG. 5.4. Earliest evidence for wheeled transport in central and eastern Europe: 1a,b wooden wheel and axle from Stare gmajne, Slovenia (c. 3500–3300 BC); 2 wooden wheel from Alleshausen, Baden-Württemberg, Germany (3000–2700 BC); 3 wooden yoke fragment from Arbon-Bleiche 3, Thurgau, Switzerland (3384–3370 BC); 4,5 wheel-shaped cups of the classical Baden culture (c. 3300–3200 BC) from Szigetszentmárton (4) and Budakalász (5), Hungary; 6,7 bowls

on perforated sledge runners, drawn by one or two oxen, from Talyanki, Ukraine, Tripolye C (c. 3700–3500 BC). Various scales. After Velušček 2002, fig. 2–3; [Schlichtherle 2002](#), fig. 14; [Leuzinger 2002](#), fig. 3; [Maran 2004a](#), fig. 5–6; [Kruc et al. 2005](#), fig. 16; [Gusev 1998](#), fig. 4.3.

Although there is no clear evidence, this circumAlpine type of wagon is assumed to be two-wheeled. [Schlichtherle \(2002, 2004, 301–304\)](#) considered triangular fork-like drags as technological forerunners, the oldest of which was found in the bog settlement of Reute (Baden-Württemberg) and dendro-dated 3709–3707 BC ([Fig. 5.5](#)).

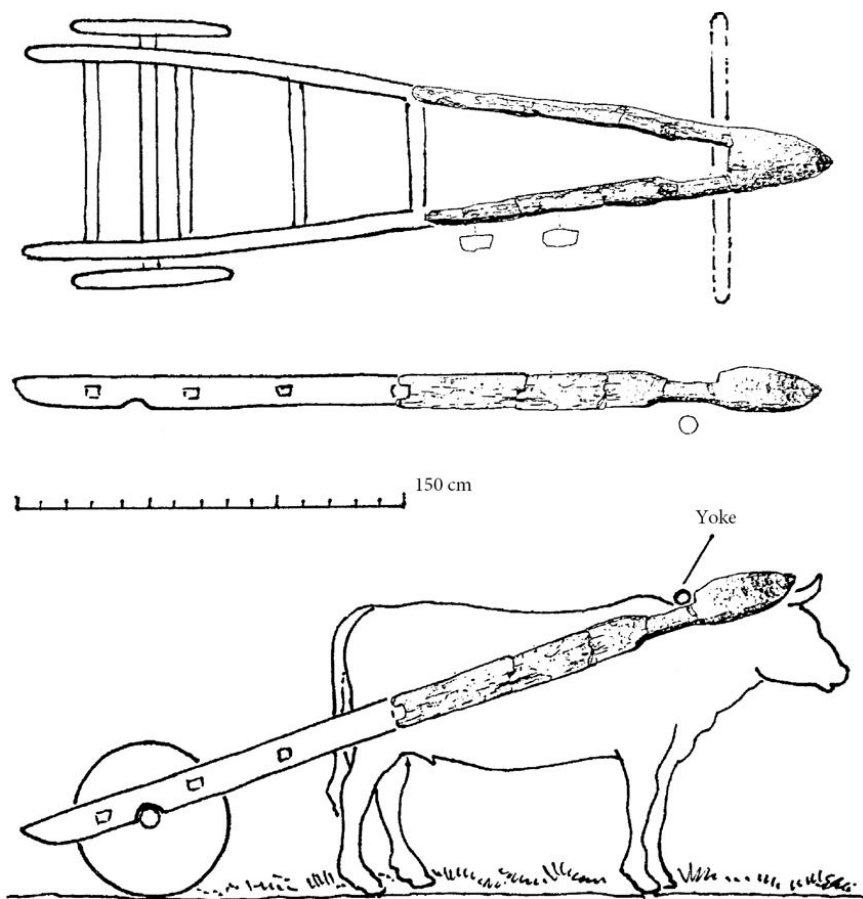


FIG. 5.5. Reconstruction of a triangular two-wheeled wagon with detachable rotating axle, based on the wooden drag fragment from Reute, Baden-Württemberg, Germany (3709–3707 BC).

After [Schlichtherle 2002](#), fig. 28.

A different type is the four-wheeled wagon known only from the famous wagon-shaped cups of the Baden culture in Hungary

(Budakalász, Szigetszentmárton; Fig. 5.4, 4–5). These appear to represent a different principle of construction. The clay wheels have a round axle hole and a hub is indicated, suggesting that the wheels turned on a fixed axle, which would give a four-wheeled wagon better steerability. The two well-known model wagons belong to the classical phase of the Baden culture (Maran 2004a, 270–272), dated to around 3300–3200 BC.

The existence of two *different* types of wagon in the Carpathian Basin and the circumAlpine region does not, however, exclude relations between both areas. The lakeside settlement of Arbon Bleiche 3 on the southern (Swiss) shore of Lake Constance, dendro-dated to 3384–3370 BC, yielded imported pottery fragments of the early (Boleráz) phase of the Baden culture (Maran 2004a, 266). The significance of these finds in terms of culture contact is underscored by a fragment of wooden yoke from the same settlement layer (Fig. 5.4, 3), one of the most ancient indicators of animal traction in Europe (Leuzinger 2002). The imported Boleráz pottery and the yoke could indicate a transfer of technology from the innovative Carpathian Basin along the Danube to Lake Constance (Maran 2004a, 278). This same route had been taken by copper metallurgy as it spread to the Pfyn culture half a millennium earlier.

Growing Mobility in the Pontic Steppe Zone

Further east, in the steppe zone of Moldavia and western Ukraine, animal-shaped clay vessels with perforated legs and containing clay wheels are known from several sites dating to phase C1 of the Tripolye culture, c. 3800–3600 BC (Maran 2004b, 438). A related category are bowls with single or paired bull head applications on sledge runners, which are perforated and seem to have contained axles with clay wheels (4, 6–7; Kruc et al. 2005, 40, fig. 16). Obviously, the idea of containers put on wheels was present in the Tripolye culture before the middle of the fourth millennium, and was associated with single or paired animals. As Maran (2004b, 432) points out, the extremely large settlements of this culture (up to several hundred hectares) and the steppe environment would reasonably explain the economic advantage of local wheeled transport.

A key role in the development and transfer of wagon technology can probably be assigned to the Majkop culture, located in the north-western foreland of the Caucasus. This highly innovative culture (Govedarica 2002) was indirectly influenced by the Mesopotamian Uruk culture, with which it is roughly contemporaneous (Maran 2004b, 433–436). The oldest wagon from a burial context comes from the middle phase (Kostromskaya-Inozemcevo) of the Majkop culture,

dated c. 3500–3200 BC: two wheels were deposited on top of a wooden cover above grave pit 18 in kurgan 2 near Starokorsunskaya (Trifonov 2004, 168).

Thus, the present evidence for early wheeled transport does not support the traditional belief in the oriental invention of wheel and wagon. Full-size wheels and axles from central and eastern Europe clearly pre-date the earliest wheels from the Near East, and the indirect evidence (models, depictions) does not allow for a temporal gradient indicating diffusion *ex oriente*. Two alternative hypotheses remain. Innovation could have happened roughly simultaneously, but independently, in several regions (the polycentric model). This could explain the contemporaneous existence of different technical variants (two or four wheels, fixed or rotating axle). Alternatively, there was only one innovation centre. Following Maran (2004b), the late Tripolye culture (around 3700–3500 BC) in the steppe area north-west of the Pontic Sea is the most likely candidate for inventing wheeled transport, and the steppe cultures north of the Black Sea show well-documented relations to south-eastern Europe. Further eastward, future research is needed to clarify the contacts between the late Tripolye and Majkop cultures, but the latter may have played a crucial role in transferring the wagon techno-complex to Mesopotamia (Maran 2004b, 438).

The deposition of wooden wagons in graves continued with the Yamnaya (Pit Grave) culture (c. 3200–2500 BC), which, according to Russian archaeological tradition, is early Bronze Age. A considerable number of remarkably well preserved wagon burials in huge mounds (kurgans) have been excavated between Kuban, the lower Don, and the southern Ural mountains (Gej 2004; Tureckij 2004), dating between 3200 and 2500 BC (Tureckij 2004, 197). Generally, these wagons have four wheels and marked hubs, with round holes indicating wheels turning on a fixed axle.

The Yamnaya culture, known mainly from kurgan burials, covers a huge area of steppe between the southern Urals and the eastern Carpathians. Consequently, several regional sub-groups have been defined (Gej 2004, 193–195). Wagon burials are more frequent in its south-eastern zone. For several decades, it has been considered a textbook example of a mobile archaeological culture due to the lack of settlements and an assumed focus on (nomadic?) animal husbandry. Isolated burial mounds, attributable to the Yamnaya culture because of burial rite and grave goods, have been discovered along the lower Danube and even in eastern Hungary (Ecsedy 1979; Gerling et al. 2012).

The Origin and Spread of the Corded Ware Culture

At the transition from the late (3500–2800 BC) to final Neolithic (2800–2200 BC), a widespread cultural phenomenon arises across central and eastern Europe—the Corded Ware culture. Its characteristic material culture (beakers with cord impressions or incised decoration, amphorae, battle axes) and burial rite (single graves, crouched skeletons in gender-specific positions and orientations) are known from western Switzerland to the Netherlands and southern Scandinavia (usually under the name Single Grave culture), and from the Rhine to Ukraine and Belarus (regionally the Fatjanovo culture). Since the beginning of the twentieth century, the widespread and apparently sudden appearance of Corded Ware was associated with the spread of the Indo-Europeans ([Gimbutas 1956, 1997](#)).

[Glob \(1944\)](#) postulated a unitary European initial phase of Corded Ware, based on axe types and their stratigraphic position in Danish burial mounds of the Single Grave culture. The supporters of this so-called A-horizon saw Corded Ware spreading from eastern Europe, without specifying a closer region of origin. Researchers in central Germany, indisputably a Corded Ware centre given site density and typological variety, argued for an origin in the Elbe-Saale region and rejected the A-horizon hypothesis ([Fischer 1956](#)). Until the 1990s the debate was based mainly on typological arguments.

In the last decade, the basis for absolute dating was considerably enhanced ([Czebreszuk and Müller 2001](#); [Furholt 2003](#)) and the focus of debate shifted towards the time, speed, and mechanisms of the spread of Corded Ware. As at the beginning of the Neolithic, the alternative hypotheses of diffusion and migration have been discussed, but also the meaning of the archaeological term ‘culture’: is Corded Ware the material expression of an ethnic or linguistic group, a social marker, or the reflection of an ideology? The culture concept and suggested model of spread obviously are mutually interdependent. Based on the evaluation of almost 200 radiocarbon dates, [Suter \(2002\)](#) postulated the end of the A-horizon, arguing that the elements of this assumed early phase span several centuries. Suter thus considers Corded Ware, together with the somewhat later Bell Beakers, as reflecting the spread of an ideology and ritual drinking customs.

Based on an even larger collection of radiocarbon dates, [Furholt \(2004\)](#) presents different results. By classifying the dating evidence according to sample quality, he is able to demonstrate a temporal

gradient for the oldest Corded Ware dates, running from central Poland to the north-west and south-west. The forms constituting the A-horizon are not the oldest ones (in Poland), but they appear in the first stage of diffusion, even if some of them persist regionally until the younger Corded Ware (Furholt 2004). Furholt even revives the old idea of an initial spread of burial rites without characteristic grave goods ('Kalbsrieth' group) as early as 2900 BC. Owing to the chronological difference between the separate spreads of burial rites and material culture, Furholt prefers two-step diffusion to migration (Furholt 2004, 493).

Comparing the evidence from lakeside settlements in northern and western Switzerland, Hafner (2002) illustrates remarkably different processes. At Lake Zürich the late Neolithic Horgen culture was completely replaced by Corded Ware within 25 dendro years, but in the west a gradual adoption of Corded Ware pottery can be observed, lasting more than one century. Suter (2002) takes up this evidence in challenging the traditional view of an immigration of Corded Ware culture in Switzerland. Both Hafner and Suter do not interpret these opposed patterns in terms of immigration versus acculturation, but argue for a 'Corded Ware ideology' that spread and was adopted at different speeds in both regions.

Recent research has considerably changed our view of the final Neolithic. For Corded Ware, an east-west gradient indicates the direction of spread. This might suggest the diffusion of ideas and their material expression, but migration should not be excluded, at least at a regional scale. A new ideology of individualized burial with battle axes as male status symbols and ritually polarized gender roles may have been important. The symmetrically opposed position and orientation of male and female individuals might even reflect complementary, gender-specific concepts of the lived world. This 'gender ideology' is maybe one of the most remarkable innovations of the final Neolithic.

Only in central Europe, where the distributions of Corded Ware and Bell Beaker overlap spatially and temporally, can the continuation of this gender ideology be understood: Beaker males lie on their left side, females on the right side—the exact opposite of Corded Ware 'rules'. Also, the orientation generally shifts from west-east/east-west to north-south/south-north. Fischer (1956) introduced the term '*dialectic of the Beaker cultures*' for this phenomenon, thus emphasizing the ideological character of final Neolithic burial ritual.

This emphasis on gender distinction within the burial ritual, possibly indicating complementary and opposed gender spheres among the living, persisted during the early Bronze Age in central Europe.

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CHAPTER 6

MOVING ANIMALS AND PLANTS IN THE EARLY NEOLITHIC OF NORTH-WESTERN EUROPE*

ANNE TRESSET

THE appearance of domestic animals and plants in western and northern Europe largely in the late sixth to fourth millennia BC has been a subject of debate for decades (e.g. Zvelebil and Rowley-Conwy 1986; Zvelebil 1989; Ammerman 1989; Whittle 1990; Tresset 2003; Rowley-Conwy 2004; Tresset and Vigne 2007). Despite scarce evidence, discussions have usually focused on the respective roles of native Mesolithic populations and immigrant farmers in the adoption of farming—a crucial issue in regions located away from the main recognized routes of Neolithic diffusion (the northern coastline of the Mediterranean, the Danube valley and tributaries).

However, recent years have seen the development of many database projects devoted to collecting, sorting, and assessing factual data in archaeozoology and archaeobotany. The large datasets collected for the late Mesolithic and Neolithic periods in Europe and the Near East, where at least some of the European domestic organisms originated, provide a more substantial foundation for debate as to the nature of early farming in Europe, including north-western Europe. Recent technological advances, particularly in the domains of aDNA, geometric morphometrics, and stable isotope analyses, as well as their more widespread application to archaeological materials have also provided new insights into the process by which farming first appeared, delivering a more precise, rich, and complex narrative than expected.

**EARLY DOMESTICATES AND CULTIGENS IN EUROPE:
NEAR EASTERN IMPORTS VERSUS LOCAL
DOMESTICATIONS**

A key question in the debate on early farming in Europe is the origin, local or foreign, of domestic plants and animals. In theory this question is relatively easy to answer in some specific instances. Sheep (*Ovis aries*) and goat (*Capra hircus*), as well as some cereals (emmer wheat—*Triticum turgidum dicoccum*, einkorn—*Triticum monococcum*, broomcorn millet—*Panicum miliaceum*) and pulses (lentil—*Lens culinaris*, pea—*Pisum sativum*, chick pea—*Cicer arietinum*, bitter vetch—*Vicia ervilia*), had no wild ancestors in Holocene Europe. Most of these species were introduced to Europe at the start of the Neolithic, with others, such as millet, introduced later in this period. Their origin can largely be traced back unambiguously to the Near East, or in some cases to western central Asia (Zohary 1969, 1996, 1999; Zohary and Hopf 2000; Colledge et al. 2005; Coward et al. 2008), before they spread across Europe along the Mediterranean and Danubian routes in the seventh to fourth millennia BC (Fig. 6.1; cf. Tresset and Vigne 2007, 2011; Tresset et al. 2009 for a synthesis). The question is more complex for domestic barley (*Hordeum vulgare*), as the wild form (*Hordeum spontaneum*) was present in the Aegean region at the end of the Pleistocene and the beginning of the Holocene (Perlès 2001), but recent archaeobotanical and molecular studies have clearly established its origin in the Near and Middle East (Badr et al. 2000; Willcox 2005; Jones et al. 2008), whilst archaeobotanical data have evidenced the discontinuity in Aegean stratigraphies between wild Mesolithic barley and the Neolithic domestic form (Hansen 1992) which is associated with crops of indisputable Near Eastern origin. There is the issue of the ‘proto-domestications’ of pulses of genera *Lathyrus* and *Vicia*, the remains of which are abundant in a number of Mediterranean Mesolithic sites, but it only marginally concerns northern and western Europe.



FIG. 6.1. Main flows of domesticate diffusion during the Neolithization of Europe. All dates are in years BC.

Modified from [Tresset and Vigne \(2007\)](#).

Until recently the possibility of European centres of domestication for a number of animal species existed. This was notably the case for cattle, *Bos taurus*, and pig, *Sus scrofa domesticus*, as their wild ancestors (aurochs, *Bos primigenius*, and wild boar, *Sus scrofa scrofa*, respectively) were present on this continent before the beginning of the Neolithic. Osteometry has often revealed overlaps or continuities between the size ranges observed for cattle and aurochs, but recent work on bovine mitochondrial aDNA (see [Tresset et al. 2009](#) for an overview) has confirmed that European domestic cattle belonged mostly to a different clade than European Aurochs (at least for maternal lineages), the former very likely of Near Eastern origin. Local domestication in the late Mesolithic (Ertebølle, fifth millennium BC) of northern Germany had been proposed given the small size of bovines at Rosenhof, Schleswig-Holstein (cf. for example [Nobis 1975](#)). However, a combination of molecular and osteometric approaches has recently ruled this out ([Scheu et al. 2008](#)), revealing that the small bovines were females, and very likely undomesticated (aurochs). Thus, we can see strong parallels between the appearance of domestic cattle

in Europe and the processes observed for the diffusion of domestic sheep and goat.

A large palaeogenetic study on the origin of European pig tells a rather different story ([Larson et al. 2007](#)). Analysis of 221 ancient and 323 modern suid samples from Europe and the Near East reveals the presence of several very divergent suid lineages before 4000 BC in Europe. Some of these lineages, identified as domestic on metrical bases, were not derived from the European wild boar, and were presumably of Near Eastern origin. In this sense, the history of early domestic pigs in Europe is very similar to that observed for sheep, goat, and cattle. However, these exogenous pig lineages were completely wiped out from Europe during the fourth millennium BC and replaced with domestic animals descended from the European wild boar. This implies that local domestication took place somewhere in Europe before, or just after, the fourth millennium BC. A Mesolithic legacy cannot be definitely ruled out as a number of late hunter-gatherer societies focused their hunting activities on suid exploitation, as in Denmark ([Rowley-Conwy and Dobney 2007](#)) and the Paris Basin ([Vigne et al. 2000](#)), and it is not impossible that some hunting strategies eventually led to ‘proto-domestications’. This is certainly possible at least in Denmark, where sea-level rise fragmented the territory into a number of small islands during the first part of the Holocene, isolating small sustainable suid populations ([Rowley-Conwy and Dobney 2007](#)) and creating good conditions for animal management (see also [Krause-Kyora et al. 2013](#)). But a Neolithic origin seems more likely in light of post-LBK (Linearbandkeramik) economic transformations which took place between 4800 and 4000 BC in several regions of central and western Europe: in Germany and northern France in particular, cultures such as the Rössen and Michelsberg focused their animal exploitation on pig husbandry ([Tresset 2003](#); [Pernaud et al. 2004](#); [Tresset and Vigne 2007](#)). It seems very likely that the two phenomena—European pig domestication and the development of pig husbandry by some Neolithic groups—are linked. Ongoing research on this subject is now focusing on identifying the exact place where this phenomenon emerged.

THE POSSIBLE ROLE OF EUROPEAN MESOLITHIC SOCIETIES

Other scenarios for the introduction of domestic plants and animals have been explored. The hypotheses of Mesolithic groups gradually adopting cereal cultivation from incoming farmers ahead of the colonization front have been advocated by a number of authors on the

basis of Cerealia-type pollen in late Mesolithic contexts (cf. for example [Edwards and Hiron 1984](#) for Britain; [Richard 2004](#) for eastern France; [Poska and Saarse 2006](#) for Estonia). O'Connell contested these views in 1987 on the grounds of the much earlier presence of Cerealia-type pollen in pre-Neolithic sequences of Connemara, Ireland. The radiocarbon date obtained (c. 6500 BC) for one of these completely excludes the possibility of it being a true cultivated cereal: at that time, cereals and cereal cultivation had just begun their expansion into south-eastern Europe, several thousand kilometres from Connemara, and more than 2000 years before the Neolithic way of life reached Britain and Ireland! That early Cerealia-type pollen probably derived from wild grasses in north-western Europe, as suggested by O'Connell, has more recently been confirmed by new findings in Britain ([Tweddle et al. 2005](#)). More recently, [Behre \(2007\)](#) reviewed all the evidence for pre-Neolithic Cerealia-type pollen and pointed out the methodological weaknesses of most of their identifications as domestic cereals (which is extremely problematic for pollen). He also concluded that if pre-Neolithic cultivation really took place somewhere in Europe, it should have left other evidence, such as macro-remains.

The question of late Mesolithic societies adopting agro-pastoral techniques ahead of the Neolithic colonization front, through long-distance contacts, has also been investigated on the basis of domestic animal remains. Old claims for domestic sheep or goat bones in Mesolithic contexts at Beg an Dorchenn in Brittany (as well as in the Gazel and Dourgne caves, southern France) were shown to be either later intrusions or misidentifications ([Tresset 2000, 2003](#); [Vigne 2007](#)). A number of cattle and sheep remains have been identified in late Mesolithic contexts in Ireland (e.g. [Tresset 2003](#) for a review), but most were derived from shell middens where stratigraphies are always complex and the attribution of an element to one level or another is often unreliable. Fortunately, a large radiocarbon dating project ([Woodman et al. 1997](#)) has provided direct dates for most of these remains. It has shown that only a cattle bone from the Mesolithic site of Ferriter's Cove ([Woodman et al. 1999](#)), located on the south-western coastline of Ireland, provides a reliable basis for discussing the acquisition by Mesolithic people of domesticates from Neolithic groups. The Ferriter's Cove cattle bone has been radiocarbon dated to the mid fifth millennium BC, a time at which the Neolithic way of life had not yet reached Ireland. Aurochs seem to have been absent from Ireland during both the Pleistocene and Holocene, providing no possibility of confusion with the wild bovine form (and no basis for a putative local domestication). All this points towards a single possibility: that the bovine in question originated on the Continent,

but the means by which it came to Ireland is obscure. Diverse possibilities have been discussed elsewhere (Tresset 2002, 2003; Woodman and McCarthy 2003; Woodman and Milner 2005), including the early colonization of Ireland, unsuccessful in the long term, by continental farmers from areas closest to Ireland (western France, western Spain, Portugal). Their lack of success could account for the absence of evidence for early Neolithic settlements, which may have been restricted to the coastline and then buried or destroyed by the subsequent sea-level rise in this region (Tresset 2003). Introduced domestic cattle might have survived as a feral population (a possibility which is not unlikely, as illustrated by the feralization of domestic sheep in Corsica by the end of the Neolithic; Vigne 1988) and been hunted by local Mesolithic groups. The next earliest date obtained for Irish cattle comes from Kilgreany Cave, Co. Waterford, where a cattle bone has been dated to c. 4000 BC (Woodman et al. 1997). This roughly corresponds to the very beginnings of the Neolithic in Ireland (Cooney 2000) and is probably part of the package introduced with the Neolithic culture. The mitochondrial aDNA sequence obtained from this bone (Edwards et al. 2004) belongs to the T3 haplogroup and allows the origin of its maternal lineage to be traced back to continental Europe and ultimately the Near East.

DOMESTICATES AND CULTIGENS: DIFFUSION RHYTHMS AND CULTURAL IDENTITIES

As illustrated above, there is evidence for complex phenomena in the adoption of farming practices in north-western Europe. However, the broad picture is one of abrupt unsynchronized change over an important part of the territory considered. This can be broadly situated in the framework of the diffusion process described by Coward et al. (2007) for cultigens in the Near East and Europe: the transmission of the crop package along the routes of Neolithic dissemination is marked by a series of cultigen and weed losses and (re)appearances which can be linked to population contacts (e.g. between Mediterranean and Danubian routes), cultural preferences, technical changes, and environmental adaptations.

The north-western part of the Continent

In the south of the Netherlands, Belgium, and the Paris Basin, a radical change in subsistence economies was closely linked to the arrival of the LBK from central Europe between the last centuries of the sixth millennium BC and the beginning of the fifth. It was

responsible for introducing domestic bovids (cattle, sheep, goat), two species of pulses (lentil, pea), two wheat species (emmer, einkorn), and naked barley to north-western Europe; flax (*Linum usitatissimum*) and opium poppy (*Papaver somniferum*) are also found occasionally at LBK sites (Knörzer 1971; Bakels 1978, 1999, 2000, 2009; Poplin et al. 1986; Tresset 2003; Pernaud et al. 2004; Bedault and Hachem 2008; Tresset et al. 2009; Salavert 2011). All of these—except the poppy—originate in south-eastern Europe and can ultimately be traced back to the Near East (Zohary and Hopf 2000; Colledge et al. 2005; Bakels 2009). The poppy is believed to have originated in the western Mediterranean, but the means by which it was brought to the western fringe of central Europe remain unclear.

Western France presents a more complex situation. The scarcity of post-Mesolithic zooarchaeological assemblages prior to the end of the fourth millennium prevents any attempt to construct complex reliable scenarios of domesticate introduction, but two relatively well-dated assemblages do suggest a date during the first centuries of the fifth millennium BC for this introduction. Remains of a small, presumably domestic, bovine have been found in one of the dry-stone structures associated with inhumations at the base of the St Michel tumulus at Carnac in the Morbihan (Le Rouzic 1932; Tresset 2002) and human remains found in the chambers have been dated to the first centuries of the fifth millennium BC (Schulting et al. 2009). A hearth and a pit in tight stratigraphic relation to two complete bovines, presumed domestic from their morphology, buried under the Er Grah tumulus at Locmariaquer, Morbihan, were dated to the sixth/fifth millennia BC transition (Le Roux 2006; Tresset and Vigne 2006). The re-dating of several well-documented late Mesolithic regional assemblages and the subsequent redefinition of the late Mesolithic chronology (Marchand et al. 2009; Perrin et al. 2009) leads us to believe that the Breton Mesolithic ended earlier than previously thought, and certainly before the end of the sixth millennium BC, thereby precluding the Mesolithic/Neolithic interaction previously proposed to explain the presence of domesticates at Locmariaquer in what was thought to be a late Mesolithic horizon (Tresset and Vigne 2006). South of the Loire valley, preservation conditions are better, and so more animal remains have survived than is the case for Brittany. The early Neolithic assemblages (fifth millennium BC) from western central France all display the same characteristics: they are dominated by wild animal remains, even after the introduction of a Neolithic way of life to the region, as revealed by associated material culture. Yet the existence of small numbers of domesticate remains proves that domestic animals had already been introduced to this region and had been adopted to some extent at least (GENACO 1998; Eneau et al. 1998; Lesur et al.

2001). Most intriguingly, contemporary pottery designs which developed in this region very often contain schematic representations of cattle and small stock horns, in an apparent paradox that has not been completely explained so far (Tresset 2005).

Relatively little is known about the appearance of cultigens in western France as plant remains from this region are rare for the beginning of the Neolithic. Assemblages found in the palaeosoils of monuments at Dissignac, Sandun, and Vivoin in the Loire-Atlantique and Sarthe (Gebhart and Marguerie 1993; Marinval 1993; Ghesquière 2003), at Lannec er Gadouer in the Morbihan (Dietsch-Sellami 2000), and at Ernes and Hébécrevon in Calvados and Manche (Marinval 1993) are notably characterized by the presence of bread wheat (*Triticum aestivo-compactum*) associated with cereals known in contexts further east. This enrichment of the spectra very likely signals contact with the Mediterranean world (Marinval 1990, 1993; Bakels 1990). Except for the Dissignac palaeosol, possibly dating from the beginning of the fifth millennium BC, the sites mentioned previously are all dated c. 4700–4400 BC. They thus probably postdate the appearance of a Neolithic way of life in western France by a few centuries.

Britain

Domestic plants and animals appeared shortly after 4000 BC in southern England (e.g. at Runnymede Bridge, Surrey; Serjeantson 1996; Windmill Hill, Wiltshire; Whittle et al. 1999; Maiden Castle, Dorset; Sharples 1991). Domestic plants, at least, are also represented in Scotland (e.g. at Balbridie, Aberdeenshire; Fairweather and Ralston 1993) and in the Midlands (Lismore Fields, Derbyshire; Jones and Rowley-Conwy 2007). In southern England, early Neolithic sites yield cattle, sheep, goat, and pig, together with cultigens such as emmer, bread wheat, and barley. Further north, at Lismore Fields and Balbridie, flax (*Linum usitatissimum*) is also represented (a find of this species from Balbridie has been directly radiocarbon dated to 3800/3900 BC). The means by which Britain was Neolithicized have been debated for decades: some authors favour Mesolithic acculturation, with the slow incorporation of domesticates and cultigens into the economy (e.g. Bender 1985; Zvelebil and Rowley-Conwy 1986; Thomas 2003), whilst others support colonization by continental farmers and the abrupt appearance of farming together with the introduction of cultigens and domestic stock at the turn of the fourth millennium (e.g. Sheridan 2000, 2003; Tresset 2000, 2003; Tresset and Vigne 2007). The hypothesis of immigrant farmers introducing the ‘Neolithic package’ from mainland Europe is supported by close similarities between the material culture (e.g.

pottery styles, [Sheridan 2000, 2003](#)), faunal spectra ([Tresset 2000, 2003](#)), and cultigen assemblages ([Fairweather and Ralston 1993](#); [Fairbairn 2000](#); [Jones and Rowley-Conwy 2007](#)) in northern France, Belgium, the Netherlands, and Germany in the last part of the fifth millennium and the beginning of the fourth millennium, and in Britain shortly after 4000 BC. A recent demographic simulation based on an extensive database of radiocarbon dates for the late Mesolithic and the Neolithic of Britain ([Collard et al. 2010](#)) concluded that the major increase observed in England and central Scotland just after 4000 BC in radiocarbon date densities was best explained by a massive arrival of human populations in these regions.

Whichever position is adopted, the foreign origin of domestic bovids (cattle, sheep, goat) and cereals is well established. The maternal lineages of British Neolithic cattle are proven to be completely distinct from those of local aurochs on the basis of aDNA analyses, and cannot stem directly from them ([Edwards et al. 2004, 2007](#)). Barley can be traced back to the Near East and Middle East on a molecular basis, and the other taxa had no Holocene ancestors in Europe (see above: Early domesticates and cultigens in Europe). The composition of animal bone assemblages and plant remains in southern England at the start of the Neolithic point towards the Paris Basin as the region of their origin ([Tresset 2003](#)). Plant remains found further north, at Lismore Fields and Balbridie, contain small quantities of flax, a plant as yet unknown in the Neolithic of the Paris Basin, but present further east in LBK and later fifth millennium contexts ([Bakels 1978, 2009](#); [Kreuz 1990, 2007](#)), pointing towards this latter region for its introduction. Multiple points of origin for a Neolithic way of life have already been suggested for Britain on the basis of material culture ([Sheridan 2003](#)).

Ireland

There is no evidence of any farming development following the early introduction of domestic cattle at Ferriter's Cove mentioned above, and it is not until the turn of the fourth millennium that we find further evidence of domesticates, associated this time with cultigens and Neolithic material culture. Zooarchaeological and archaeobotanical data are scarce in the Irish Neolithic, and it is thus difficult to confirm (or infer) the absence of domestic animals and plants during the period 4500–4000 BC, as absence of evidence is not evidence of absence. However, if we exclude the cattle bone at Kilgreany Cave, Co. Waterford, which was not found in a secure Neolithic context, we can see that other findings are clearly connected to Neolithic material culture. The remains of several early Neolithic

houses, dated to the first centuries of the fourth millennium BC, have lately been discovered throughout Ireland (see [Brophy](#), this volume). Cattle and sheep remains have been found in some of them (notably at Tankardstown, Co. Limerick, and at Cloghers, Co. Kerry; [Gowen 1988](#); [Kiely 2003](#)). Many of these houses also yielded charred cereal grains: emmer and barley have been found at Ballyharry, Co. Antrim ([Moore 2003](#)), and at Tankardstown, Co. Limerick ([Monk 2000](#)). Interestingly, bread wheat has been found, together with barley, at Drummery Lower, Co. Donegal ([Dunne 2003](#)), and at Cloghers, Co. Kerry ([O'Drisceoil 2003](#)). As seen above, bread wheat was well represented in western France during the fifth millennium, where it is believed to have been introduced via a connection with the Mediterranean; its presence on the western coast of Ireland could suggest either an introduction from Scotland, where it is known in the early Neolithic, or directly from contact with the western fringe of mainland Europe.

FROM INTRODUCTION TO ACCLIMATIZATION: THE INVISIBLE WALL

Adapting biological cycles and conditions of plant and animal development to non-Mediterranean environments was probably among the most important challenges faced by Neolithic farmers. Diets and birth seasons in animals, and growing conditions and flowering time in cereals and pulses, would have been profoundly affected by the transfer of these living organisms to new environments with climatic characteristics, circadian rhythms, vegetation types, and soil qualities very different from the ones that prevailed in the areas which saw the birth of husbandry and agriculture. In particular, difficulties probably arose when animals and plants left the Mediterranean area and began their expansion northward. As we can still observe today, traditionally bred unimproved cattle and sheep have slightly different birth seasons along a south–north gradient in Europe. This lag is essentially due to differences in the seasonal availability of vegetation, which modulates the timing of the reproductive cycle in cattle, or to differences in the seasonal day length at different latitudes of Europe, which strongly drives the reproductive cycle in sheep. Such differences have been highlighted between the sheep of the Paris Basin and the Orkney Isles during the fourth millennium BC using a methodology based on the isotopic analysis ($\delta^{18}\text{O}$) of the crown of the tooth of different individuals ([Balasse and Tresset 2007](#)). This method allows comparison of the stages of development of these teeth at a given season of the year, and, consequently, differences in the birth season to be estimated

(Balasse et al. 2003). The results suggest that adjustments of the reproductive cycle (e.g. a later onset and a tight synchronization of individual cycles in some cases) had taken place before the fourth millennium BC or just after in northern Scotland. A similar methodology—but this time using $\delta^{13}\text{C}$ —has revealed that some of the Neolithic sheep from Orkney had also been fed on marine resources—very likely seaweed—during winter (Balasse et al. 2006). This constitutes a strong adaptation to the marine environment and predates by several millennia the oldest known writings on this practice (Fleuriot 1986).

Cereal growing probably underwent similar adaptation to local conditions: the current distribution of photoperiod-responsive and -non-responsive variants of barley in Europe shows a clear pattern along a south–north gradient. The non-responsive variant is dominant in the north and the responsive variant in the south. Both forms exist in the wild, and allow the flowering time to be driven by or divorced from day length. Recently it has been suggested on molecular grounds that the clearly differentiated distribution of these variants in Europe resulted from a differential selection within the plant populations conveyed along the two main routes of Neolithic dissemination after they had both reached Europe (Cockram et al. 2007; Jones et al. 2008, 2013).

ESCAPED ORGANISMS, STOWAWAYS, AND INVADERS

Domesticates and cultigens were deliberately moved across Europe by migrant farmers, but a number of species may have escaped human control at an early stage of this diffusion and colonized new territories by themselves. Feral animals might just as easily have survived the desertion of some territories after Neolithic colonies failed to establish, as suggested above for the cattle from Ferriter's Cove.

Plant and animal production, storage, and the accumulation of foodstuffs by Neolithic farmers would have attracted unwelcome organisms such as weeds, commensal animals, parasites, and diverse germs. These would have been introduced to new territories along with farming practices and domestic species. Palaeoparasitological studies of samples from the Alpine region have clearly established a link between the arrival of new farming populations and the appearance of new parasites during the middle to late Neolithic (Le Bailly et al. 2007). Although no comparable evidence yet exists for north-western Europe, it seems extremely likely that human movement also conveyed new parasites to these areas. Recent syntheses have shown that the house mouse (*Mus musculus* ssp.)

became a commensal in the Near East as a correlate of sedentarization and the development of cereal storage during the Natufian—that is, before the emergence of the Neolithic *sensu stricto* (Cucchi et al. 2005). They subsequently followed the initial expansion of farmers, but once in Europe their spread slowed down and stopped in south-eastern Europe for several millennia, only reaching western Europe well after the end of the Neolithic. The earliest evidence of their presence in continental Europe is at Bucasani Tell, Romania, c. 3500 BC (Cucchi et al. 2011), associated with a wide spectrum of small native mammals such as field mice (species of the genus *Apodemus*), voles (genus *Microtus* and *Arvicola*), hamsters (*Cricetus cricetus*), and shrews (in this case species of the genus *Crocidura*). Such a spectrum is yet to be identified at any site in western Europe, but a number of species of these genera probably lived in close contact with humans and human installations in this region. This is notably suggested by their introduction to a number of islands during the Neolithic. The Orkney vole (*Microtus arvalis orcadensis*) is an emblematic example of these processes. *M. arvalis* is today absent from mainland Britain, and there is no evidence to suggest its presence there during the Holocene: its appearance in Neolithic Orkney is thought to result from its accidental introduction by boat (Corbet 1961; Haynes et al. 2003; Thaw et al. 2004; Cucchi et al. 2009; Martinovka et al. 2013). Wood mouse (*Apodemus sylvaticus*) has also been reported from several Orcadian Neolithic sites, suggesting their early introduction to these islands (Corbet 1979; Sutherland 1983; Yalden 1999), and pigmy shrew (*Sorex minutus*) is thought to have been introduced to Ireland during the Neolithic according to both molecular and zooarchaeological findings (Mascheretti et al. 2003; McDevitt et al. 2009).

CONCLUDING REMARKS

From the beginning of the Neolithic, animals and plants were moved by humans into and across Europe, purposefully or unwittingly, at a scale never seen before. As such, they can be considered the continent's earliest biological invaders, well before the intercontinental movements of the Renaissance and modern times that led to the introduction of dozens of new alien organisms into Europe. Archaeozoological and archaeobotanical evidence, coupled with palaeogenetics and biogeochemistry, reveals that most of the domestic lineages introduced to Europe adapted fairly quickly to their new environmental conditions. Beyond the plasticity of these organisms, this highlights the skills of generations of Neolithic farmers who

succeeded in acclimatizing them. Modern farming still relies on their achievements.

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CHAPTER 7

LANGUAGE, GENES, AND CULTURAL INTERACTION

STEPHEN SHENNAN

THE most extensive and long-lasting, sometimes passionate, debate in studies of the European Neolithic has concerned the extent to which farming was introduced through a process of indigenous adoption or the expansion of farming populations. It is in the context of this debate that arguments about languages and genes, and the application of mathematical methods from genetics, were introduced into the study of the European Neolithic and continue to play a major role. In this essay I will review the history of arguments about genes and languages and how they have contributed to this debate, examine the current state of this field, and conclude by relating the arguments to our growing knowledge of demographic patterns.

Following on the work of [Clark \(1965\)](#), [Ammerman and Cavalli-Sforza \(1971\)](#) showed that if the dates of the first arrival of farming in a given location were plotted against distance from the assumed origin of agriculture in south-west Asia (taken to be Jericho) there was a good fit to a straight-line relationship, with a correlation of 0.89, and an overall rate of spread of about 1km per year (using uncalibrated dates). They went on to propose that this rate made sense if farming spread by a process of ‘demic diffusion’ ([Ammerman and Cavalli-Sforza 1973](#)), a spatial expansion of population arising from the greater productivity of the new subsistence system compared with hunting and gathering, following a model created to describe the wave of advance of an advantageous gene and subsequently to describe the process of population expansion (see [Steele 2009](#) for a review). In this model the rate of increase in the size of the population at a given place depends on a population growth component and a diffusion component. The rate of growth depends on the size of the initial population, the maximum growth rate, and the nearness of the population size to the local carrying capacity, because as the population nears carrying capacity growth slows down until a density-dependent equilibrium is reached. The value of the diffusion

component depends on the average dispersal distance of individuals in the time between birth and reproduction. The speed at which the wave of expanding population travels is dependent on the diffusion value and the maximum population growth value. Ammerman and Cavalli-Sforza found that if they took ethnographically derived values for growth rates and marriage distances in farming populations and plugged these into the relevant equations the resulting rate of spread corresponded well to that actually observed.

Subsequently, a principal components analysis summarizing the variation in a large number of genetic markers in modern European populations (this was before actual DNA information from present-day populations became available) turned out to show that the main pattern of variation corresponded with a strong spatial trend from south-east to north-west Europe (Menozzi et al. 1978; Ammerman and Cavalli-Sforza 1984). The authors postulated that the trend could be accounted for by their demic diffusion model for the spread of farming, with the immigrant farming signal being successively diluted over time by intermarriage with indigenous hunter-gatherers. On this basis, a link was established between a postulated process accounting for the origin and spread of farming into Europe between 9,000 and 6,000 years ago and evidence from the genetics of present-day populations. But it was also possible to link genetic patterns to the distribution of languages, it was argued, since an expanding population would carry its language with it, and its descendant languages as time went on, not just its genes.

As far as Europe is concerned, the key question about languages, going back to the late eighteenth century when its existence was first proposed, has always been how to account for the pattern of relationships between the languages of the Indo-European family, distributed as they are all the way from Ireland to India and believed by historical linguists to descend from a common ancestor, proto-Indo-European, estimated by most historical linguists to have existed about 6,000 years ago (but see below in the Language section). This question had been of interest to archaeologists prior to World War II, and was the subject of one of Gordon Childe's early books, *The Aryans* (1926). However, because of its association with Nazi ideas of the existence and superiority of 'the Aryan race', questions about the relationship between archaeology and language largely disappeared from the mainstream European prehistory agenda after World War II.

The main exception to this trend, at least to the west of the Russian language sphere, where discussion continued, was the work of Marija Gimbutas (e.g. 1963), who proposed that the distribution could be accounted for by the spread of nomadic peoples east and west from the Ukrainian and Russian steppe north of the Black Sea, her

suggested homeland of Proto-Indo-European speakers. These peoples were traceable archaeologically by their use of ‘kurgans’ (Russian for burial mounds), hence the term ‘kurgan hypothesis’ or ‘kurgan invasions’ to describe this spread, which could be dated archaeologically, it was argued, to around 4000–3000 BC, thus fitting the date proposed by many linguists for the initial split of proto-Indo-European. In subsequent work (e.g. 1991) Gimbutas went on to propose that the ‘kurgan invasions’ marked a major break in the prehistory of Europe because they were responsible not just for the introduction of new languages but for the demise of what she regarded as the matri-centred cultures of the early Neolithic—what she called ‘Old Europe’—and their replacement by a new set of male-centred social and cultural institutions.

In 1987 Colin Renfrew, in his book *Archaeology and Language*, brought the relationship between the two back into the archaeological mainstream in a way that could not be ignored, given his by then established position as one of the leading figures in the development of the New Archaeology and its introduction to Europe. In it he proposed there was no convincing evidence in the European Neolithic and Bronze Age after the initial spread of farming for large-scale migrations of the kind that would be required to account for the spread of Indo-European languages; thus they must have arrived with the expansion of population that introduced farming, by a process of demic diffusion of the kind proposed by Ammerman and Cavalli-Sforza, a suggestion he had first made in outline much earlier (Renfrew 1973). Importantly, their demic diffusion model showed how it was possible for populations to spread without mass migrations, since no individual on this model need move very far at all.

Where are we today? How have the ‘Wave of Advance’ model and genetic and linguistic arguments for it fared, and how do they relate to the archaeology? Both Ammerman and Cavalli-Sforza’s genetic arguments and Renfrew’s linguistic ones have proved extremely controversial, but also extremely productive, in that they have generated an enormous amount of new interdisciplinary research and have also created massive interest in a public well beyond archaeology. For archaeologists they have also proved quite problematic, in that both genetics and linguistics are highly technical subjects whose arguments are difficult to evaluate by those who do not have the appropriate training. In the remainder of this chapter I will review the current state of the various arguments, before concluding by considering the archaeological evidence for their demographic implications.

It is worth pointing out from the outset that what most geneticists have been concerned with by and large is trying to explain the proportions of gene variants of different putative origins in modern populations. This is not the same as investigating the proportion of migrants involved in the spread of farming, say, 8,000 years ago.

As far as Cavalli-Sforza's and colleagues' principal components analysis inferences are concerned, it has subsequently been shown that spatial clines based on such synthetic data can arise from a variety of different processes, including population replacement with successive founder effects (i.e. an immigration process without successive dilution by intermarriage with indigenous populations) (e.g. [Barbujani et al. 1995](#)); by gradients in the duration of natural selection, for example, if the farming way of life had an effect on the survival and reproductive success of people with certain genes that effect would have lasted more than 2,000 years longer in south-east than north-west Europe because farming arrived much earlier there ([Fix 1996](#)); or even as a result of simple 'isolation by distance', with gene flow between adjacent stable populations ([Novembre and Stephens 2008](#); [Ray and Excoffier 2009](#)). Accordingly, this line of argument can no longer be considered valid.

The genetic studies that followed relied on newly available data on the lineages of mtDNA, relevant to female genealogies, and Y-chromosome DNA, relevant to males ([Richards et al. 1996](#); [Semino et al. 2001](#)). On the basis of identifying specific gene lineages (or haplogroups) estimated to have a most recent common ancestor (MRCA) in the Neolithic as opposed to earlier—this is done by counting differences in mt or Y-DNA between present-day individuals, calculating the number of mutations required to get back to a common ancestor for those individuals, and then using the so-called 'molecular clock' to give a date in years with an error margin—they proposed a contribution (or admixture) of immigrant Near Eastern genes to the general European population today of 20% for mtDNA and 22% for Y-chromosome DNA, and saw this as strong evidence that the introduction of agriculture largely involved cultural diffusion between indigenous Mesolithic groups. However, it has been shown that there are many problems with this argument. First, the date of a MRCA does not tell us anything about a colonization date. If Mars is colonized in the future by a team consisting of individuals of Chinese, African, and European ancestry, the date of the MRCA will be well back in the Palaeolithic and certainly will not date the colonization of Mars! Second, other studies that attempted to explicitly model demographic events between 8,000 years ago and the present have come up with

much higher contributions of 'Neolithic' genes to the present-day European gene pool (e.g. [Chikhi et al. 2002](#); [Currat and Excoffier 2005](#)). More generally though, if one is trying to evaluate the extent of genetic admixture between two populations and their relative contributions to a descendant population, using one or two genetic loci does not provide enough information to do this with any confidence ([Belle et al. 2006](#)). Belle et al. therefore analysed data from 377 different autosomal genes, i.e. those where one copy is inherited from each parent. In order to do such admixture analyses one needs to identify present-day populations that can be regarded as roughly corresponding genetically to Mesolithic European populations of local Palaeolithic ancestry and to incoming Neolithic farmers. Like all previous investigators, they chose the current Basque population to represent the former and present-day Near Eastern populations for the latter. In all cases they found a cline, with the proportion of Near Eastern genes decreasing with distance from that region, at a very high level of correlation; but even at the extreme western end of the distribution the estimated proportion of genes of putatively Near Eastern origin in the present-day European gene pool was at least 50%. It is apparent that the implications of these varied results for the different versions of the demic diffusion and cultural diffusion models of the spread of farming into Europe remain unclear. Arguably, this lack of clarity is unsurprising given the complex chain of links between data from present-day populations and inferences about the origin of populations interacting (or not) 8,000 years ago, not least the questionable modern proxies that have been used for ancestral source populations. Moreover, such studies cannot take into account data from genetic lineages that have since gone extinct.

Clarification is now beginning to come from the gradual accumulation of aDNA (ancient DNA) analyses of prehistoric populations, but the interpretation of these also requires caution. [Haak et al.'s \(2005\)](#) study of ancient mtDNA from Linearbandkeramik (LBK) skeletons in central Europe found that the most frequent type, present in 25% of the samples, is extremely rare today, occurring in only 0.2% of the population—a decline in frequency that is very unlikely to be simply the result of genetic drift alone. The authors favoured the idea that this could be accounted for if a very small number of pioneer immigrant farmers were soon overwhelmed by local foragers adopting farming. They also noted, but largely discounted, the possibility that it could be explained by a subsequent population replacement. Either way, the inference is that the LBK farmers contributed little to the genetic composition of modern European populations.

A more recent study comparing aDNA patterns for European

Mesolithic hunter-gatherers and LBK early Neolithic farmers and modern mtDNA samples from European populations has radically changed this picture ([Bramanti et al. 2009](#)). It has confirmed the probable lack of continuity between LBK farmers and modern Europeans, but has also shown that there is no continuity between the hunter-gatherer and modern populations either. More importantly from the archaeological point of view, it appears that there is no genetic continuity between the Mesolithic and early Neolithic populations, confirming the demic diffusion model for the spread of farming, at least in this part of Europe. It is particularly striking that there is a lack of continuity in the mtDNA, indicating female descent, because many models that include a demic diffusion element still assume the incorporation of hunter-gatherer females into the farming population (e.g. [Price et al. 2001](#)).

Another example of population extinction and replacement processes is provided by the results of [Linderholm's \(2008\)](#) recent aDNA study of Neolithic populations in Sweden. Here a very clear archaeological distinction between the middle Neolithic Trichterbecher (TRB) culture and the contemporary Pitted Ware culture has long been recognized. Linderholm's analysis demonstrated that these represented two genetically distinct populations, and that whereas the genetic patterns of the TRB population continued into the local Bronze Age, the Pitted Ware patterns appear to die out. Interestingly, the TRB population also showed a higher frequency of the lactose tolerance gene, potentially reflecting a history of stronger natural selection related to milk consumption in this population. A recent simulation study suggests that selection for the lactose tolerance gene started around 7,500 years ago in a region between the Balkans and central Europe ([Itan et al. 2009](#)); aDNA evidence indicates that frequencies were initially low ([Burger et al. 2007](#)), as would be expected.

In summary, we should be very careful in making statements about the composition of the present-day population in terms of its ancestry at particular times and places during the Neolithic, or earlier, because we cannot assume that there was massive regional population continuity up to the present. Ancient DNA evidence is beginning to tell us what we want to know about populations in the past much more directly than the extended chains of assumption and inference from the present that previously were the only available option. The complex history of population extinctions and replacements that aDNA studies are now revealing is also suggested by alternative lines of evidence for regional population fluctuations (e.g. [Shennan and Edinborough 2007](#), and see below).

LANGUAGE

Whilst the genetic evidence has increased enormously in quantity and quality since it was first brought into the debate about the origin and spread of the European Neolithic, the continuing debates about language have not seen a corresponding improvement in the quality of the evidence, and without the discovery of new ancient written sources they never will. Thus, language is virtually always, in effect, the dependent variable in discussion—its history being inferred and its distribution patterns explained on the basis of putative links with the evidence of archaeology and genetics, which is then correlated with the known linguistic patterns.

Since Renfrew's initial proposal that the spread of Indo-European languages resulted from the demic expansion of farming into Europe, the debate has continued to focus on this language family and mechanisms for its spread, with an ongoing dichotomy between those who take the traditional view of a late date for proto-Indo-European at around 6,000 years ago and those who take Renfrew's view. This dichotomy has broad ramifications for views of what went on in the European Neolithic and Bronze Age.

For the traditional Indo-Europeanists it is not just a matter of language distributions but of a set of social institutions that are characteristically 'Indo-European'. Whilst some authors (e.g. [Anthony 2008](#)) continue to subscribe to the kurgan hypothesis and see both languages and social institutions as the cultural baggage associated with expanding populations of steppe origins, others (e.g. [Kristiansen 2005](#)) take a more differentiated view, suggesting that the institutions, which, it is claimed, are evidenced in the archaeological record, and by inference the languages, which are not, spread through a combination of more local migration and a process of 'peer polity interaction' ([Renfrew 1986](#)) linked to the spread of prestigious innovations and increased mobility. Unfortunately, we have no way of knowing whether the proposed Indo-European institutions of the late Neolithic and early Bronze Age were exclusively associated with Indo-European speakers, even less with people *becoming* Indo-European language speakers. On Renfrew's hypothesis many of them would long have been Indo-European speakers anyway ([Renfrew 2005](#)). The unresolved issue here is whether the claimed Indo-European institutions are similar by virtue of common descent, shared with language; whether they spread 'horizontally' across linguistic boundaries, as social and economic innovations often do, perhaps leading people to drop their pre-existing language and start speaking a local Indo-European one for prestige reasons; or whether they arose as a result of convergent development (cf. also [Robb 2009](#)).

In any case, there is increasing evidence that Renfrew's argument for the early date of proto-Indo-European is correct. This is based on the application of phylogenetic analyses—initially developed for the construction of family trees based on genetic data—to linguistic data, in the form of lists of cognate or non-cognate words of similar meanings in different Indo-European languages, including ancient ones. In this case the specific purpose of the analysis is to estimate the most probable date for proto-Indo-European, the most recent common ancestor of the Indo-European languages. The methods are mathematically extremely complex and it is unnecessary to go into detail about them here, but they have been successively refined since their initial application, to take into account problems that have been raised (Gray and Atkinson 2003; Ryder and Nicholls 2010). The methods have consistently produced dates in the range 6000–7500 BC for proto-Indo-European, with the most recent study producing a 95% probability interval in the range 5100–7800 BC, centred at 6400 BC. After investigating the potential impact of a range of factors that might bias their results (e.g. failing to recognize ancient word borrowings), Ryder and Nicholls conclude that the only factor which could make a major difference to their results, and bring them more into line with the traditional date, would be if there had been a major change in the rate of word diversification in a coordinated fashion across all the Indo-European languages then in existence between 3,000 and 5,000 years ago. Of course, this is not impossible, but given that it would involve coordinated changes all the way from India to the western half of Europe it seems unlikely.

In contrast to most existing views, Heggarty et al. (2010) propose that in Europe at least, proto-Indo-European did not break up initially into the distinct sub-families of Italo-Celtic, Germanic, and Balto-Slavic, which were late developments, but was characterized by a pattern of 'dialect continua'. That is to say, the original uniformity of proto-Indo-European did gradually degrade as a result of local linguistic innovations taking place in particular places and not spreading throughout the whole area, but different innovations had different and often overlapping distributions, with specific innovations tending to be shared by places that were geographically closer. Thus, the reason that the Germanic sub-family shares features with both the Italo-Celtic and the Baltic-Slavic sub-families, and is therefore problematic for those constructing Indo-European language trees, is simply because of its geographical position between the two in central and northern Europe, and its consequent sharing of innovations from both sides. For Heggarty, the presence of such dialect continua is more in keeping with versions of Renfrew's proposal that proto-Indo-European spread with the ongoing population expansion by small-

scale societies that was associated with the spread of farming, rather than with the expansion of mobile warlike hierarchical societies 3,000 years later. However, in his view, it probably was the appearance of such societies that led to the emergence of a more clearly differentiated linguistic picture later on, as some initially small-scale societies expanded at the expense of others and their dialects (in the way that we know Latin, for example, expanded at the expense of other local Italic languages), and as local population movements led to the juxtaposition of groups who spoke different languages because of their previous spatial separation. In other words, there is not necessarily complete incompatibility between an earlier proto-Indo-European spread and some of the claims made by supporters of the more traditional view.

Whether or not the varying degrees of demic diffusion associated with the spread of farming that are now accepted by the majority of authors were linked with the spread specifically of proto-Indo-European, we can still ask what its linguistic consequences might have been. If the lack of genetic continuity between incoming LBK farmers and local Mesolithic populations is also true for other parts of Europe, then the answer is language replacement. But the result is likely to be the same even if small numbers of foragers were successively incorporated into an expanding farming population, because the foragers would always have been coming in as a small minority; thus they, or at least their offspring, would be under strong pressure to adopt the farming language and the gradually changing language could potentially extend over far wider areas than the genes of ancestral farmers—this is [Renfrew's \(2002\)](#) 'Staged Population Interaction Wave of Advance' model.

However, it is not the only possibility. [Ackland et al. \(2007\)](#) developed an alternative model of the kinds of process that might have occurred. Once again, they assume demic diffusion arising from agriculture as the more productive subsistence strategy, and non-adaptive cultural features like language are simply carried along with the expanding population. The model includes a farming population with its cultural baggage and a forager population at much lower densities with its own traits, which converts from foraging to farming, its population potentially growing to the same level as its neighbours. In a geographically differentiated landscape, if the expanding population of farmers arrives at a boundary where, for example, soil conditions are less suitable, the front stops until the population behind the front has reached a sufficient level to make it worth expanding again. However, the new subsistence mode can still potentially spread to the forager population in advance of the wave, as for them it may be worthwhile because it gives them better returns than hunting and

gathering. In these circumstances, if the main farming frontier is static for long enough, the forager population can grow sufficiently to provide a barrier to the expanding original farming population (even if that had incorporated a lot of indigenous foragers on the way). The result will be a cultural/linguistic boundary between the two populations.

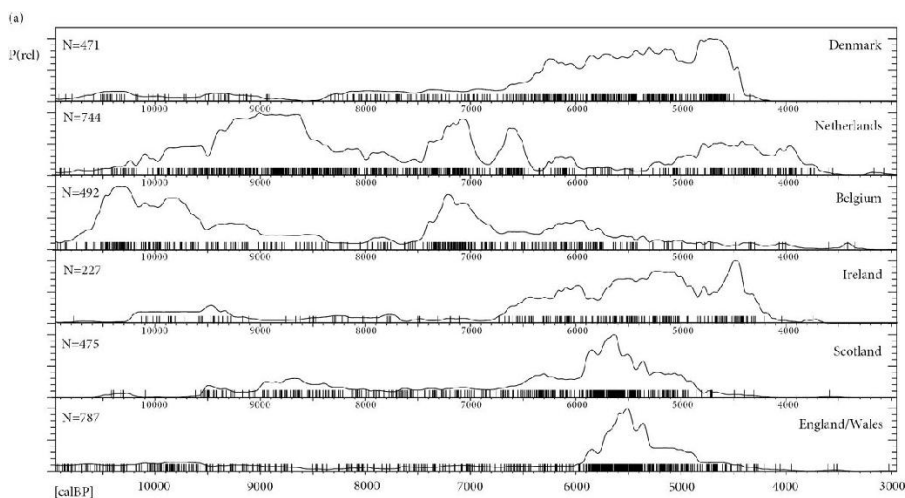
The fact that farming did not spread at a uniform rate, but was characterized in different regions at different times by periods of expansion and stasis, is now well established (e.g. [Guilaine and Manen 2007](#); [Bocquet-Appel et al. 2009](#)). Thus, the potential for the sort of process modelled by Ackland et al. certainly existed, though whether it actually happened anywhere is uncertain (see below). That the process involved stops and starts also brings out the problems with the initial Ammerman and Cavalli-Sforza model of the spread of farming. Whilst it remains broadly true that the rate of spread they identified represents a valid first-order approximation to the overall rate of spread from the Near East to north-west Europe, they argued that the rate in itself gave an indication of the explanatory mechanism, demic diffusion by the wave of advance. This is because of the constancy of the rate this model produces and because the application of the ethnographically derived population growth rates and marriage distances to the diffusion equation gave the rate they found. Since the process was actually one of stop-and-go, with very different expansion rates at different times—as Ammerman and Cavalli-Sforza themselves acknowledged—this argument cannot be considered valid in itself as a justification for the demic diffusion model, even though, as we have seen, there are other arguments that strongly support it.

These shortcomings have recently been addressed by [Davison et al. \(2006\)](#), who keep the same basic population dynamics and diffusion ‘wave of advance’ model but add a parameter to allow for the possibility that movement may not be equal in all directions; certain directions, for example along major rivers or coastlines, may be preferred. Moreover, local carrying capacities can vary, dependent, for example, on altitude and latitude. When the equations are run with the values that Davison et al. propose and justify for variations in the preferred direction of movement and carrying capacity, the fit of the model to the pattern of dates for the arrival of farming in different parts of Europe is very good, so the results do not just produce a description of the rate of spread but support demic diffusion as the mechanism after all.

DEMOGRAPHIC PATTERNS

As we have seen, virtually all the arguments above, about both genes and languages, depend on claims about population sizes and distributions. What evidence do we have for these during the periods in question?

Gamble et al.'s (2005) study of population fluctuations in the western half of Europe in the late Palaeolithic and Mesolithic, based on summed radiocarbon date probability distributions as a population proxy, suggested that, with the exception of certain coastal areas, populations in the later Mesolithic were at historically low levels, presumably because the developing forest cover resulted in decreasing animal population densities. Figure 7.1 shows the summed date probabilities approach taken forward into the Neolithic for a number of broad areas where good data are available (see also Shennan 2009). In the majority of cases, very low late Mesolithic population levels are succeeded by massively increased levels with the initial arrival of farming. In Belgium, the Netherlands, and Germany this occurs with the arrival of the LBK in the second half of the sixth millennium BC. In England and Scotland we see the same phenomenon c. 4000 BC. Denmark and Ireland appear to be exceptions, with relatively high late Mesolithic population levels, though both show indications of a slight dip at the point where agricultural economies arrive.



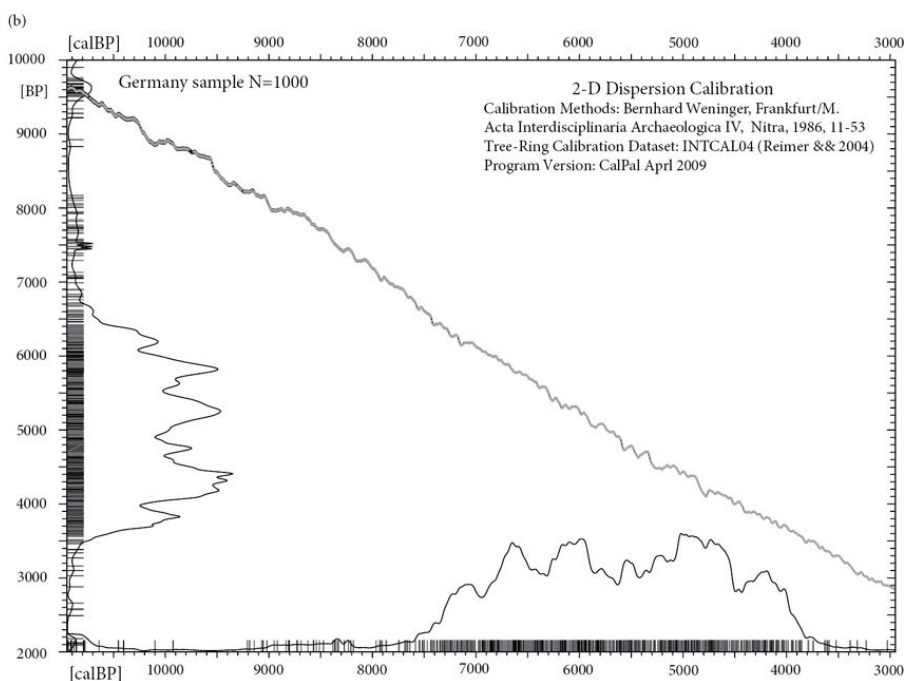


FIG. 7.1. Summed radiocarbon date probabilities taken as a proxy measure for the Neolithic populations of several regions of north-west Europe (from [Weninger et al. 2009](#)).

Whilst care must be taken with the use of summed radiocarbon probability distributions as population proxies, the pattern of a decline in population levels over the course of the Mesolithic has also been recently shown at a more detailed level by [Vanmontfort's \(2008\)](#) study of trends in Mesolithic occupation in several areas of the Low Countries on the basis of the chronological and spatial distribution of microliths. It appears that those specific areas of the Low Countries which subsequently became LBK early farming nuclei had long been devoid of Mesolithic occupation. Similar arguments have been made for a discontinuity or hiatus between late Mesolithic and early Neolithic in many parts of south-east and Mediterranean Europe, on the basis of gaps in site stratigraphies, especially caves (e.g. [Berger and Guilaine 2009](#); [Bonsall et al. 2001](#)).

It would appear, then, that the arrival of farming had a massive demographic impact in many areas, as predicted by the demic diffusion model. If an originally Near Eastern genetic composition of the farming population had been successively diluted by the absorption of small numbers of foragers, as some versions of the demic diffusion model propose, then this might not have made much difference to the local genetic composition of the population, but at least with the LBK the results of [Bramanti et al. \(2009\)](#) are against this

scenario. Even if it were valid in some areas, for the reasons explained in Renfrew's 'Staged Population Interaction Wave of Advance' model, demic expansion would certainly have changed the languages spoken.

However, arguably more interesting than the first appearance of farming for many of the arguments outlined above is the evidence that [Figure 7.1](#) provides for subsequent complex demographic histories, and there is no reason to believe that these are unique to the regions shown. Moreover, these are very gross aggregate regions. It is likely that at the scale of actual settlement areas they would be even more pronounced (cf. [Pétrequin 1997](#)). Indications of population decline at the end of the LBK are apparent not just in the aggregate radiocarbon patterns shown in [Figure 7.1](#), but also more locally (e.g. [Zimmermann 2002](#)), and the results of [Linderholm's \(2008\)](#) and [Bramanti et al.'s](#) aDNA studies have been described above. What are needed to understand the real histories of genes and languages are reconstructions of local demographic histories coupled with aDNA analyses.

Thus, for example, if we take the coastal zone of the Low Countries, which was outside the area of LBK distribution, the initial adoption of farming in the late fifth millennium is represented by the adoption of cereal cultivation as one strategy among many by local forager groups ([Cappers and Raemaekers 2008](#)), with no suggestion that this was precipitated by pressure from adjacent growing farming populations. The local population growth associated with this suggested by [Figure 7.1](#) would lead one to predict the existence/expansion of local Mesolithic genes and languages here, but whether this left a long-term legacy is uncertain. The suggestion of population decline in the Low Countries after 6,000 years ago potentially implies that this expansion was short-lived, so whatever languages and genes were current here in the late fifth millennium may have disappeared.

In Denmark, by contrast, it seems that a foraging economy based largely on aquatic resources supported a large population in contact with farming cultures to the south for hundreds of years, which then switched largely to agriculture over the space of a couple of hundred years after 4000 BC, with the appearance of the local TRB culture. If this is really what happened, this large population could have provided the basis for the continuation of local Mesolithic genes and languages. In Germany, although all the populations after the arrival of the LBK are basically agricultural ones, in contrast to the Low Countries, the major population fluctuations suggested by [Figure 7.1](#) indicate the strong possibility of regional abandonments and recolonizations throughout Neolithic prehistory and no doubt later, given the very low population levels that generally prevailed (cf. [Zimmermann et al. 2009](#)), with obvious potential genetic and

linguistic consequences.

CONCLUSION

In summary, aDNA evidence is becoming increasingly important in accounting for the patterns observed in more conventional archaeological evidence, as is the characterization of regional population histories. In the case of the European Neolithic, inferences about language will almost certainly depend on information from these other sources, rather than language data providing a basis for inferences or tests of hypotheses in their own right, though further technical advances like those used to infer the date of proto-Indo-European may alter this. Mathematical and simulation modelling of the processes involved in the spread of farming and of the implications of interpopulation interactions for genetic and linguistic patterns will continue to provide an important basis for the development and testing of specific hypotheses about the spread of farming. However, they will need to incorporate more spatially and chronologically specific information if they are to be useful in understanding the more localized population turnover patterns that are beginning to emerge from the aDNA and demographic proxy data for Europe after the initial arrival of agriculture.

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Sequences of Cultural Interaction and Cultural Change

CHAPTER 8

THE BALKAN NEOLITHIC AND CHALCOLITHIC*

JOHN CHAPMAN

INTRODUCTION

DWELLING between the Mediterranean zone of the Aegean and Anatolia and the cooler and snowier central European heartlands, the communities living in south-east Europe 7000–4000 cal BC created distinctive social formations leaving enduring marks on today's landscapes ([Fig. 8.1](#)). First studied systematically by V. Gordon Childe in 1929, these groups have been the focus of intensive research for the past 40 years ([Tringham 1971](#); [Hodder 1990](#); [Whittle 1996](#); [Bailey 2000](#); [Chapman and Gaydarska 2006](#)). They lived in a mosaic of settings, comprising two large Danubian plains and mountainous regions almost 3,000m in height (the word 'Balkan' is Turkish for 'mountain'). This topographic setting provided a suite of complementary resources—summer pasture, metals, lithics, and stones for tools in the mountains; alluvial gold, potting clay, and arable lands in the lowlands—and created the potential for symbolical differentiation of these two zones. The interplay of the Familiar (one's local community), the Foreign (other settlements sharing the same material culture), and the Other (communities with different material culture and lifeways) ([Neustupný 1998](#)) led to distinctive cultural combinations.

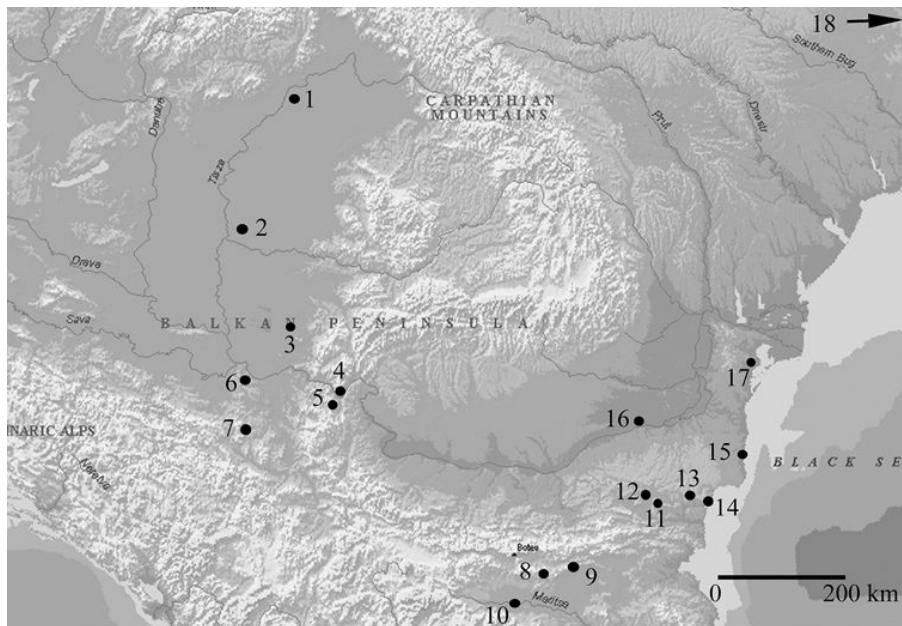


FIG. 8.1. Map of key sites in the Balkans and the Carpathian Basin: 1—Polgár-Csőszhalom; 2—Gorzsa; 3—Parța; 4—Lepenski Vir; 5—Rudna Glava; 6—Vinča-Belo Brdo; 7—Grivac; 8—Ai Bunar; 9—Karanovo; 10—Dolnoslav; 11—Ovcharovo; 12—Polyanitsa; 13—Goljamo Delchevo; 14—Varna; 15—Durankulak; 16—Baia Hamangia; 17—Sabatinovka; 18—Nebelivka.

This account has four sections, covering the nested, and closely inter-related, socio-spatial contexts of (i) persons, (ii) households, (iii) corporate groups in the settlement context, and (iv) regional settlement networks in the landscape. Each section ranges far and wide, with the heuristic use of the terms in [Table 8.1](#) to provide a *non-evolutionary* social and cultural framework.

Table 8.1 Outline chronology of the Balkan Neolithic and Chalcolithic

Period	Date (cal. BC)	Principal social networks
Late Mesolithic	8000–5000	Lepenski Vir, Schela Cladovei, Pobiti Kamen; Soroki group; Jászág group
Early farmers	6300–5000	Karanovo I/II; west Bulgarian painted wares; Starčevo; Körös; Criș; Impresso
Mature farmers	5200–4500	Karanovo III–V; Usoe; early Vinča; early Butmir; Hungarian LBK; Dudești; Boian; Hamangia
Climax period	4700–4000	Karanovo VI; Varna; Sava; Gumelnița; late Vinča; late Butmir; Tisza-Herpály; Cucuteni; Tripolye
Post-Climax Copper Age	4000–3000	Karanovo VII; Cernavoda; late

The communities termed ‘early farmers’ represent people whose subsistence economies relied largely upon domesticated plants and animals mainly deriving from Anatolia and/or the Aegean. The twin settlement forms of the tell and the flat site showed regional variations, as did painted wares, whilst other forms of material culture (figurines, bone spoons, stamp seals, antler sickles, and coarse wares) were found in each region. Intra-mural burials predominate, with few grave goods and little gender differentiation.

After a millennium of farming, social integration and improved farming techniques led to a higher degree of sedentism and settlement nucleation, and an expansion in areas settled among those groups termed ‘mature farmers’. Typically south Balkan lifeways, such as tell living, became more common north of the Danube. Local and regional identities were marked materially by using diverse decorated wares, figurines, and other ritual equipment. Alongside intra-mural burials, corporate cemeteries of individual burials emerge as a focus for consumption of prestige goods.

The complex ‘climax period’ (Chalcolithic/late Neolithic) betokens significant regionalization in all aspects of cultural identity. A staggering level of material diversification—whether in metallurgy, ritual, lithic technology, or ceramics—is found among communities often living on tells, but most particularly in their cemeteries. Enclosed sites are also a feature of these fifth millennium communities.

In the ‘post-climax chalcolithic’, markedly different depositional strategies reduced the quantity and diversity of material culture on small settlements, large corporate cemeteries and, more frequently, in metal and other hoards. An exception to settlement dispersion is the growth of Ukrainian Tripolye mega-sites, up to 320ha in size—the largest settlements in fourth-millennium Europe.

PERSONHOOD AND THE EVERYDAY

Compared with the late Mesolithic, Neolithic/Chalcolithic practices undeniably created new kinds of person, just as these new kinds of persons created a different material world. This multiple emergence can be framed within developmental age and gender principles specific to their societies and related to the ways that objects contributed to creating persons.

The emergence of new kinds of personal skills was of major importance at the start of the Balkan Neolithic and the Copper Age

(Chapman et al. 2006b; Chapman and Gaydarska 2011). Farming necessitated new types of skills, pertaining in particular to farming and herding but also potting, polished stone tool-making, and perhaps brewing. These skills co-emerged with new foodstuffs and objects, such as flour, bread, pottery, and axes. Notions of personhood were influenced by new relations based upon these embodied skills, as well as by their interplay with traditional skills. The discovery of secondary products—milk, wool, and traction—again ushered in new episodes of personal skill-creation. Persons involved in skilled crafts, such as ‘miners’, would have been united by a shared practice of communal labour and a communally validated system of rewards for the production of a valued material. The cross-cutting interests of such groups created a differentiated society, requiring complex and powerful practices of integration. The widespread failure of such integrative practices led to a less complex society, dependent upon exotic metalwork, in the post-climax period.

The emergence of new kinds of personal skills through practice is nested within two contrasting age- and gender-based principles guiding people’s life-course, each materialized in the lifecycles of the dominant style of clay figurines. The first is ‘Hamangia-type personhood’, widespread among early farming groups, showing a three-stage development (Chapman and Gaydarska 2006):

- birth as an androgynous person grown out of both parents (complete androgynous figurines with female traits and a male, phallic neck with testicles symbolized by breasts);
- gradual shedding of one gender during maturation to become a single-gendered person (breaking a complete figurine into a male neck and female body);
- old age, when the return to androgyny marks the integration of all gendered identities of the life-course (complete androgynous figurines).

Whilst almost all fragmentary figurines were discarded in settlements, where they were used in everyday negotiations over gender relations, many complete figurines were found in graves, symbolizing the integration of gendered identities as the culmination of an age trajectory.

In contrast, the three stages of ‘Dolnoslav-type personhood’ (Chapman and Gaydarska 2006), typical in the mature farming and climax periods, are:

- birth of a person without gender characteristics (gender-neutral figurines);
- gradual growth of one gender during maturation (single-gender females/males);
- gradual fading of that single gender for post-menopausal women and older males (gender-neutral figurines).

This emphasizes gender as a characteristic of growth and personal maturation rather than the inheritance of both genders from birth and a higher value placed upon age. If Hamangia personhood is essential, with androgyny present at birth and death, Dolnoslav personhood relied on adding single-gender characteristics during the life-course—an incremental form of gendering.

The rich material culture of south-east Europe and the Carpathian Basin differentiates it from Neolithic communities further north and west. Objects reveal two ways by which personhood was created. The design principles embodied in material culture show how people understood and valued their world and, simultaneously, an objectification of persons in the objects they made and used. Certain design principles embodied a geometric outlook on material forms—symmetry, compartmentalization, precision, and standardization (Fig. 8.2) (Chapman and Gaydarska 2006). People making pottery or macroblades embodied these principles and practices, and those seeing and using such forms accepted the materialization of those principles into their *habitus*. An aesthetic of colour and brilliance was also central, whether in highly burnished fine wares, brilliant gold decorations, or shining shell rings (see Chapman and Gaydarska, this volume; Chapman 2006, 2007).

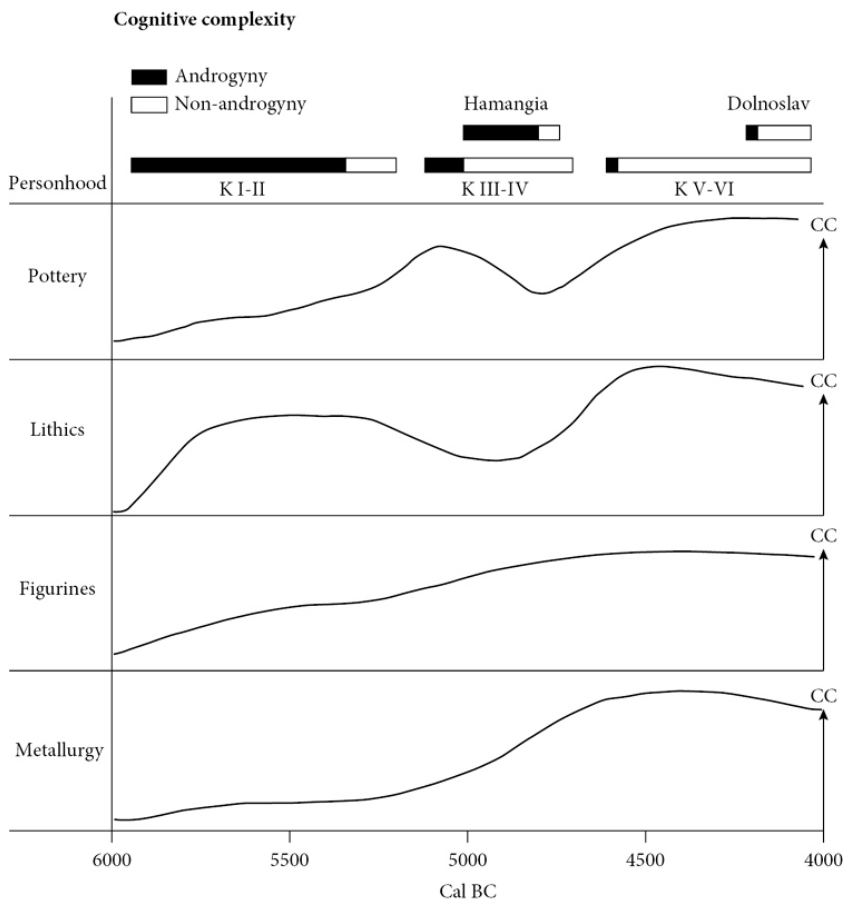


FIG. 8.2. Schematic representation of cognitive complexity in later prehistoric Bulgaria ([Chapman and Gaydarska 2006](#), [fig. 8.1](#)).

These key principles were expressed in different materials. In the early farming period, locally manufactured pottery ([Spataro 2007](#)) showed technical mastery and precision in painting, but standardization of design was minimal and compartmentalization limited to low feet and, rarely, lids. This changed dramatically in the mature farming period, when the aesthetic of colour and brilliance was materialized in widespread dark burnished wares. Compartmentalization and precision increased through legs, handles, lugs and lids, and the new 360° design fields. Colour contrasts in decoration and a wider range of forms lower levels of standardization. The diversification of forms continued in the climax period.

Similarly, fired clay figurines in the early farming period showed low indices of standardization, but multi-part androgynous rod-head figurines required right-left symmetry, some precision, and compartmentalization. In the mature farming period, the frequency

and diversity of fired clay figurines increased, especially in the central Balkan Vinča group (Hansen 2007), but precision, compartmentalization, and standardization remained low. The climax period emphasized variety of sizes, shapes, materials, contrasting surface colours, decoration, and contexts of use and deposition, whilst figurine-making virtually collapsed in the post-climax period.

Lithic production demonstrates a contrasting trajectory. In the early farming period, macro-blades made on colourful high-quality raw materials showed signs of symmetrical design, precision of core preparation and pressure-flaking, and standardization of blade production. In the mature farming period, lithics were less diversified. Local raw materials dominated in the south Balkans, contrasting with an emphasis on producing shining black obsidian bladelets in the north Balkans (Biró 1998). The climax period saw a wider range of chipped stone tools than before. At one extreme was the household making of end-scrapers for working skin in the yard—at the other, the 41cm-long superblade from grave 43 in the Varna cemetery. Superblade technology represents the apogee of lithic technology in Balkan prehistory (Manolakakis 2005). Some superblades were made in the post-climax period, but smaller tools predominated.

A few exotic polished stone objects are known from the early farming period, with a wider range of forms, including miniatures, and materials—marble, nephrite, jadeite, and occasionally turquoise—in the mature farming period. Extraordinary skill went into the highly polished climax period carnelian beads, with up to 32 facets on a small surface, probably made using a fast wheel (Kostov 2007). Polished stone sceptres typified the martial character of the post-climax period.

Metal objects in the early farming phase occur in a limited range of shapes (awls, fish-hooks, beads, and rings), which betokens early steps using an unfamiliar material that nonetheless shone beautifully. Quantity and differentiation of metal objects remained modest until the climax period. Then coppersmiths relied upon technical innovations to produce a wide range of objects. The other highlight of the climax period was goldworking, as exemplified in the Varna cemetery (Eluère and Raub 1991). Gold wire, sheet gold, gold casting and gold painting allowed the creation of an enormous range of new ornament forms, showing symmetry and precision, but a marked lack of standardization. In the post-climax period, an exotic Caucasian technology based upon arsenical copper created new forms of bright and colourful status objects (Sherratt 1976).

To summarize, the early farming age-gender principle of essential inherited characteristics (the ‘Hamangia’ type) matched a reliance on ancestors, near and far, as well as promoting gender harmony. The

later, incremental principle of age-gender development (the 'Dolnoslav' type) resonated with increasing social and material complexities in the climax period. From the earliest farming period, fundamental geometric principles of harmony and precision and an aesthetic of colour and brilliance are combined, with a complex pattern of change, and a peak in design complexity for all materials in the climax period. How did these changing structures and practices work out in the domestic domain?

HOUSEHOLDS

Houses and households have been central to many debates in Balkan prehistory, whether as symbolic principles for living (Hodder 1990), as living entities enfolding social practices (Bailey 1990), as the basic decision-making unit for economic and social practices (Tringham and Krstić 1990), as places for gendered encounters (Tringham 1991), as the material framework structuring settlement space (Kotsakis 1999), as places incorporating the new relations of Neolithic lifeways (Jones 2005), or as distinctive structures shaped by ideologies as much as practices (Souvatzi 2008). Here, the house is treated as an equal agent in relationships from which persons and households reflexively emerged in processes creating and materializing cultural values.

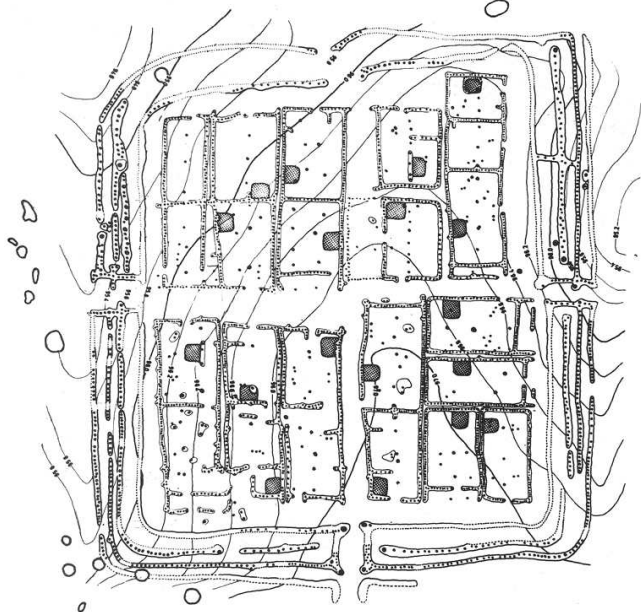
At most stages of their biography, households would have contained the elderly, the middle-aged, children of both genders, domestic animals, and perhaps garden plants. Living together and interacting much of the time, the persons in their variety of combinations, changing yearly and perhaps seasonally, created the personality of their own house. It was largely out of the household that gendered (in)dividuals emerged through reiterated practices of cultural transmission.

Cultural transmission also concerned domestic animals, which were incorporated into households and became transformed from an exotic presence in the early farming period to familiar local staples—mostly cattle and pigs, adapted to the Balkan climate, by the mature farming period. The range of cultivated cereals and pulses narrowed further north and west across Europe (Colledge and Conolly 2007), but whether for social or climatic reasons remains unclear. Their tending, harvesting, conversion into food, storage, and consumption created a new suite of personal skills and defined a fundamental set of household practices. Successful relations between plants, animals, and humans ensured a wider range of environments could now be permanently settled. These extended settlement opportunities were materialized through a tradition of timber-framed, wattle-and-daub

housing continuing to this day in parts of Europe.

The construction of the standard one-floor, two-roomed prehistoric house required considerable communal labour, comparable to that needed to build a small western European megalithic tomb. As with objects, precision, symmetry, and compartmentalization were of great importance in building a house and maintaining geometrically-based cultural order. For instance, the location of most entrances symmetrical to the gable end or the long wall created a left-right, back-front symmetry potentially drawn upon to frame social relations and action inside the house. The main posts and beams involved precision in their cutting and assembling, as did the coppiced wattling. The division of the interior revealed varying degrees of compartmentalization, whether vertical or horizontal. Finally, house standardization can be seen at many sites through markedly similar length:width ratios, room number, and layout of internal fittings. The regularities in the dimensions of houses at Lepenski Vir, Targovishte, Radingrad, and Poljanitsa ([Chapman 1989](#), fig. 12; [1990](#)) indicate the effort spent on carefully reproducing traditional design, based upon ancestral practices materialized in the successive phases of long-term dwelling. This long-term continuity in fundamental principles of geometric order strongly influenced the persons growing out of these houses.

We should not over-stress standardization in houses, any more than in objects: diachronic differences in size, shape, building techniques, and construction materials are well attested ([Bailey 2000](#); [Burdo et al. 2012](#)). However, houses in many different cultural contexts shared overall design principles. Houses were normally rectangular, whether built of wattle-and-daub or, exceptionally, of stone, as on the Durankulak tell. The regularity of a rectangular internal space allowed further regularity in spatial sub-divisions through walls, screens, or upright posts, as well as the adding of extra rooms—a potential rarely utilized until the climax period (e.g. the seven-room house at Gorzsa, Hungary; [Horváth 1987](#); the eleven-room house at Poljanitsa, Bulgaria; [Todorova 1979](#), Table 14) (here [Fig. 8.3a](#)). Houses were higher than any palisades and fences and so clearly visible from within and outside the settlement. The emphasis on the vertical and visibility was especially marked in two-storey constructions (e.g. on the Csőszhalom tell; [Raczky et al. 2002](#)). Moreover, the house provided a counterpoint of order and tidiness to the disorder of the external spaces, where walking over exposed sharp ends of animal bones and sherds, food refuse, and faeces could have been a dangerous, and smelly, enterprise. In short, the house co-emerged with its household, using a geometric logic embodied in the many miniature house models known from the Balkans and eastern Europe.



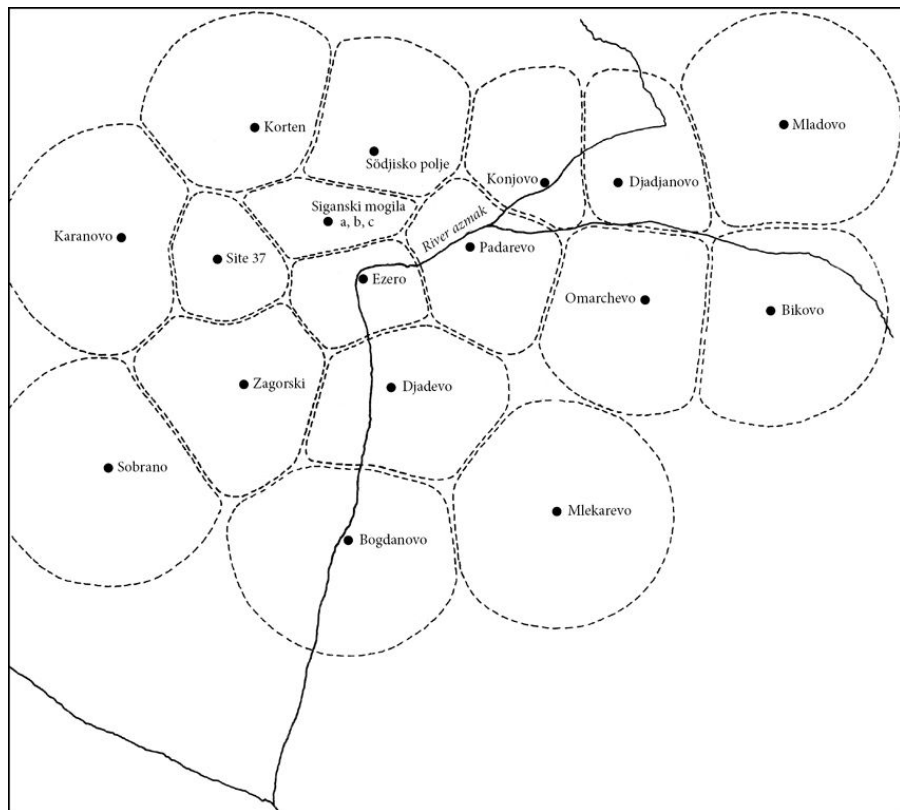


FIG. 8.3. (a) Plan of Polyanitsa Phase IV (adapted from [Todorova 1979](#), Table 14). (b) dispersed tell network (adapted from [Dennell and Webley 1975](#), fig. 8.3).

Turning from principles to practice, the diversity of household activities carried out in similar two-roomed structures has hitherto been assumed rather than demonstrated (cf. [Hayden and Cannon 1983](#)). Many everyday household practices, such as sleeping (often on a special platform), food storage (usually in a special annexe), and cooking were embedded in domestic ritual, as indicated by the figurines often deposited in association with the spatial foci of such activities ([Chapman 1981](#)). Some scholars maintain that those structures containing altars, plinths, or concentrations of figurines indicate not just domestic ritual, but public ‘shrines’ (e.g. Parța, Romania, [Lazarovici et al. 2001](#)). However, the ‘normal’ household materials (animal bones, sherds, and lithics) deposited in these structures suggest the ritualization of domestic spaces rather than Near Eastern-like public buildings ([Bradley 2005](#)).

The final stage of some Neolithic, and many Chalcolithic, houses was their deliberate burning ([Stevanović 1997](#)), perhaps upon the death of a household leader. The emotions spilling over from

bereavement and the memories of the person now lost to the household were symbolically evoked in the dramatic, transformative ceremony of house burning, from which emerged a distinctive ancestral identity for the newly dead and the beginnings of a healing process for the ruptured society. Added symbolic value emerged out of the memory of the material culture burnt with the house. The visual spectacle of a house-burning ceremony also symbolized the transformation of a community-wide nexus of relations. It is to this level that we now turn.

COMMUNITIES AND CORPORATE GROUPS

Whatever their size, permanence, and structure, the communities in Balkan Neolithic and Chalcolithic settlements represented something more than the total of the personal and enchainment relationships within their boundaries—the symbol of a supra-household and trans-generational entity, materialized through settlement plans, object accumulation, and other shared practices. Moreover, the community guaranteed a shared identity that anchored a person in a moral and juridical framework without overly constraining (in)dividuals in their lifeways.

The personal identities based upon community membership emerged out of the settlement's specific context. For an extended family in an isolated homestead, the house was the central focus of identity as symbol and practice, but the household required, for survival, a breeding network enchainment it to another 0 or 40 homesteads. In the tell-based or open village, the multiplication of identical elements (house, oven, storage area, sleeping platform) produced a coherence reinforcing the identities of separate households and framed relations within and between them in a consistent way. However, living on an isolated homestead offered fewer possibilities for diverse personal practices than living on a tell, with its wider range of persons ready to transmit embodied skills.

In areas with dispersed settlement structures, low-level centres developed, sometimes as enclosed sites ([Chapman et al. 2006a](#)). Our poor knowledge of such sites is a direct consequence of the paucity of aerial investigations. Most enclosed sites shared the same contexts of structured deposition—especially pits—with unenclosed sites, but feasting deposits, special colours, and figurine clusters are more frequent in enclosed sites. Enclosing banks and ditches reinforced the geometric order of circular interiors.

The principles of cultural order were variably expressed at the community level. The majority of horizontal settlements were not

deliberately planned, growing through multiple copies of the same spatial clustering of the house-and-garden complex, which brought persons, plants, and animals together in an intimate way. The obvious exception was the concentric principle structuring vast, 250-hectare Tripolye settlements such as Nebelivka, culminating in over 1500 rectangular buildings arranged in two concentric circles (Chapman et al. 2014). The alternative pattern of a grid of houses built along parallel paths (e.g. Grivac: McPherron and Srejović 1971) was apparently rare on horizontal sites.

Whilst tell dwelling reinforced the ancestral basis for personhood, with people living above where the ancestors had lived, certain climax period east Balkan tells exemplified remarkable geometric order, embodying the principles of symmetry, precision, compartmentalization, and standardization (e.g. Polyanitsa and Ovcharovo, Todorova 1979) (Fig. 8.3a). However, west Balkan tell communities generally rejected the geometric option in favour of loose structuring similar to nearby horizontal sites (e.g. the Vinča tell, Chapman 1989). Whichever layout, many activities were impossible on tells, such as growing legumes or herbs in a garden, herding sheep or cattle, organizing outdoor rituals or dances, smelting copper ores, or firing ceramics. This spatial differentiation of practices on or off the tell led to a well-developed sense of appropriate and inappropriate behaviour.

In the climax period, the messages from objects and the built environment were curiously contradictory. Villages and houses tended to embody geometric order whilst material forms produced an explosion of diversity and differentiation that threatened standardization. The proliferation of limited interest groups, whether households, kinship groups, occupational units, or age-sets, was a principal aspect of identity. To the extent that Copper Age persons increasingly lived in planned villages, geometric order and the spatial segregation between appropriate and inappropriate behaviour strongly influenced personhood.

Mortuary statements, a key element of community structure, were not as common or monumental as those in the Neolithic of north-west Europe. The key long-term practice in the Balkans was individual burial of complete bodies, with occasional 'deviant' burials—where elements were added or subtracted from the corpse, or replaced by objects or animal parts. Collective burials were rare, except in the early farming period (Chapman 2010).

On early farming period tells and flat sites, intra-mural burials were the commonest form of disposal (Lichter 2001). Age or gender differentiation by mode of burial or grave goods was rare. Creating a mortuary zone separate from the settlement produced a new distance

between the living and the dead alongside the necessity to bridge that gap, as through deliberately fragmentating objects, with one part in the grave and one part with the living. Corporate cemeteries (from a dozen to several hundred graves) became established in the mature farming period, usually in regions of dispersed settlement (Fig. 8.4). However, poor and rich intra-mural burials are also known. Many rare exotic objects were deposited, sometimes with favoured adults, sometimes with children. In the climax period, cemeteries became more widespread and larger. The mortuary domain also stimulated a huge increase in the acquisition and deposition of exotic objects, a trend related to the growth of copper- and gold-working. Only the Varna cemetery shows hierarchical differentiation, suggesting vertical structures were used to integrate societies characterized by increasing complexity and diversity. Elsewhere, communities drew on the same range of material culture to establish age- and gender-based identities. By contrast, no cemeteries have been found in some regions characterized by settlement nucleation (e.g. Cucuteni-Tripolye) or dispersion (e.g. south Bulgaria), where intra-mural burial continued. In the post-climax period, the mortuary domain gained in importance relative to the settlement domain, with barrow-dominated landscapes in eastern Hungary and parts of the east Balkans.

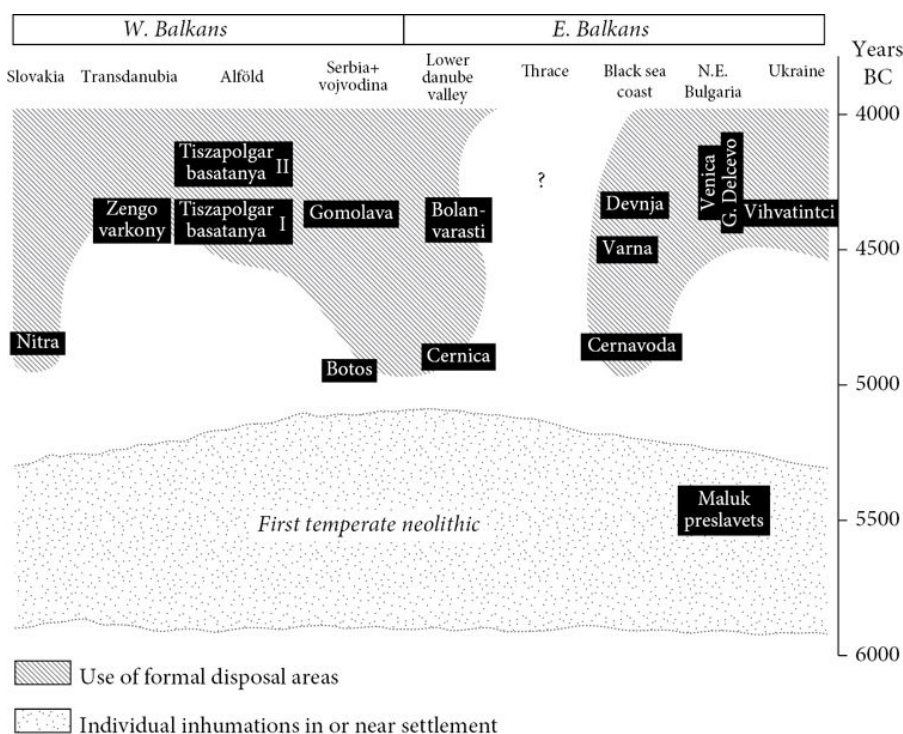


FIG. 8.4. Spatial scale of mortuary practices (Chapman 1983, fig. 8.3).

Corporate groups gained in importance with the development of a major mortuary domain or a significant level of settlement planning. Interestingly, the conjoint development of both is rare: an exception is north-east Bulgaria, with small cemeteries often located near their respective tells (e.g. Goljamo Delchevo). This suggests that channelling corporate power into one domain or the other was a form of constraint upon that power by households or individuals. To put these power relations into a wider context, we now turn to the landscape and the networks crossing it.

LANDSCAPES AND SOCIAL NETWORKS

The social relations of a person may be conceived as a network of nested sets of contacts, most intensive near the home settlement and decreasing with distance. Larger, seasonal festivals would have brought together extended families from many homesteads—perhaps an entire breeding network—providing a regular context for exchange and marriage negotiations. The larger groups of people living on tells also formed part of overlapping breeding networks, perhaps linking a tell particularly closely to four or five others. In each type of network, low-level ‘centres’ emerged, perhaps for decades or longer, as focal points for the communal identity of dispersed kin networks.

The choice of place for such an accumulation of communal memories was a vital decision. Examples from dispersed networks included the foraging centre at Lepenski Vir, with its concentration of locally produced and exotic things ([Chapman 2000, ch. 6](#)); Dolnoslav, with its concentration of ceramic and figurine fragments, which was central to dispersed tell networks; the Vinča tell, with ritual innovations in its early phase ([Chapman 1998](#)); and the large horizontal Turdaş settlement, with its rich pit deposits.

Settlement density was an important factor in local networks ([Chapman 2000](#)). Whilst the distance between early Neolithic tells ranged between 10km (the Struma valley) and 25km (north Bulgaria), the density of the east Balkan late Chalcolithic settlement network meant a tell was rarely more than 5–8km from its neighbours ([Dennell and Webley 1975, fig. 8.3](#)) (here [Fig. 8.3b](#)). The implications of increased density were more informal contacts and a wider choice of social relations for individuals, potentially leading to tensions or clashes of loyalty within households or settlements. Closer relations stimulated increasing demand for objects to materialize these relations. The overall impact was undoubtedly a growing social complexity—materialized in the complex designs of climax-period ceramics, figurines, and metalwork. However, as a counter-example,

late Neolithic tells and large horizontal settlements in eastern Hungary, with their rich material culture, were often separated by 20–25km, whilst the peak of copper and gold deposition occurred at a time of pronounced settlement dispersion (Sherratt 1982, 1983).

The negative side of increasing density and complexity was the increase in tensions between (in)dividuals and groups. Much warfare may simply be triggered by the failure to reciprocate an enchained gift with an object of suitable fame, the theft of another's sexual partner or a copper axe, or the excessive usage of inter-communal resources. Significantly, the quantity and diversity of weapon-tools and defensive structures steadily increased from the early farming to the climax period, when there was a quantum leap in defences and the first appearance of true weapons (Chapman 1999). The emergence of a new kind of person—the 'warrior'—as attested at the Varna cemetery confirms the importance of local warfare.

At the regional scale of exploration and contacts, people discovered the environmental diversity of the Balkans, especially complementary resources offered by lowlands and adjacent uplands (Chapman 2008). Early farmers were clearly familiar with both areas. Although we know more of their lives in the lowlands of the Thracian valley or the Alföld plain, they also settled in inter-montane basins in the Rhodopes and the Carpathians, making seasonal visits to even higher zones and depositing lowland material culture in rocky places. Conversely, lowland dwellers regularly brought a part of the mountains to the lowlands: lithic raw materials, fine stones, or pigments. There was also exchange between different lowland zones; for instance, exotic, high-quality, honey-coloured flint for macroblade production marked the start of the Neolithic over much of the Balkans. Thus, one opposition regularly drawn on to structure social relations was that between local and exotic objects, whether from the uplands or the distant lowlands. The abundance of shiny and colourful exotic raw materials and objects lent visual diversity to lowland settlements, but could also become a basis for ritual power through control over the exotic (Chapman 2007).

Later expeditions for metal took mature farming groups far outside the lowland zone. Discovering such a remote and small-scale source of copper as Rudna Glava (Jovanović 1982) implies systematic prospection of uplands, leading to the discovery of many other lithic sources for tools and ornaments. For example, an increased range of raw materials was used more intensively by Vinča groups in comparison with Starčevo early farmers (Chapman 1981, 77–83). Exchange of exotic materials in the climax Copper Age, whether pigments, stone ornaments and figurines, salt, shells (see Chapman and Gaydarska, this volume), or flint and metal objects, enchained

increasingly wide groups of people. The mines and surface exposures of north-east Bulgaria provided high-quality flint for macroblade production in the south Balkans, as well as the north Pontic and eastern Carpathian zones (Manolakakis 2005). Everyday social reproduction was increasingly based on the difference between exotic and local materials. The lead isotope analyses of late Copper Age metal objects indicated the use of many separate copper sources all over the Balkans (Pernicka et al. 1993, 1997; Gale et al. 2000). Despite the large-scale labour invested in the Ai Bunar mine (Chernykh 1978), locally deposited objects were mostly made of copper from north-west Bulgaria and eastern Serbia; Ai Bunar thus became one node in an ‘export-led’ exchange network.

Overall, the entanglement of the exotic in the identities of local people reached its apogee in the climax period. The sedimentation of increasingly strong links to local places challenged people to define their place in the world by acquiring exotic objects through inter-group exchange or the activities of long-distance specialists (Helms 1993). In this way, remote landscapes were often ‘domesticated’ in settlements through the presence of their physical remains—whether volcanic rocks, marine shells, or metal. Intertwined biographies of places, persons, and things in settlements and cemeteries spread across the Balkan landscape are a particular characteristic of the Neolithic and Chalcolithic.

SUMMARY

In this chapter, I have tried to give a flavour of Balkan later prehistory—of the kinds of persons comprising a family in a rectangular timber-framed house in a west Balkan open settlement or an east Balkan tell site. The predominance of settlements makes these lifeways quite distinctive from those of north-west Europe, with communal values and principles relating to geometric order, harmony, colour, and brilliance clearly materialized in a vast array of objects in the home and within the settlement. Intriguingly, although exotic objects occurred from the earliest farming period, it is only in the fifth millennium BC, with the expansion of the mortuary domain, that the ancestral basis of communal living was partially displaced by an ideology of material accumulation as much related to individual persons as to corporate groupings.

ACKNOWLEDGEMENTS

In such a work of synthesis, I have drawn upon the research of many people whom I have met over many years and to whom I am very grateful. It would be (in)vidious to signal out a few (in)dividuals from that large group of friends and colleagues whose contributions are deeply appreciated. I cannot ignore the contribution of my wife, Bissierka Gaydarska, to my life and to my research over the last eight years. For this, no measure of thanks is too much to give.

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CHAPTER 9

THE NEOLITHIC IN MEDITERRANEAN EUROPE*

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INTRODUCTION: THE MEDITERRANEAN AS A MELTING POT

THE Mediterranean provided the primary conduit for the movement of domestic plants and animals from the Near East to other landmasses and islands. The linkage between the pristine zone (Minnis 1985) of south-west Asian domestication and Neolithization in the Levant and Europe was modelled to a large extent on the nature of the Mediterranean 'lake' that was bordered by three continents. This juxtaposition of lacustrine-bordered landmasses doubtless influenced the nature of agricultural spread and adoption over a rapidly expanding area between c. 10,000 and 6,000 years ago and the cultures that emerged from this process.

The Mediterranean sea is c. 2,505,000km² in surface area, measures c. 4,000 km east to west and c. 800km north to south, and is enclosed by an indented coastline of enormous length between Asia, Africa, and Europe. It contains at least 1,000 habitable islands, the largest of which, Sicily and Sardinia, cover some 25,000km² each, and the island archipelagos provide 'stepping stones' for the dispersal of cultural and economic materials, ideas, and settlement. From later Palaeolithic times, larger islands adjacent to landmasses were exploited, enabled by low sea levels or the use of early sea craft. The basin of the Mediterranean is surrounded by upland *massifs* and rugged mountain chains (Atlas, Taurus, Pindos, Apennines, Alps, Pyrenees), some of which form the distinctive peninsulas dividing the basin into separate zones (Iberia, Italy, Balkans, Anatolia). Little of the region is classified as lowland, and coastal plains are mostly narrow and restricted, offering relatively limited landscape suitable for early Neolithic farming. The upland landscape, drained by river valleys with steep gorges and torrents and short, wide, and shallow 'wadis', often causes floods and catastrophic erosion once cleared of vegetation. The

climate around the Mediterranean fringes is similar to the Levant, with hot, dry summers and mild but often wet winters. Inland climates differ far more, especially in upland zones, with marked seasonal conditions and cool winters. Even coastal north Africa claims a Mediterranean climate. Whilst the domesticated plants and animals of south-west Asia were adapted to dryer, hotter conditions, the coastal environment of much of the Mediterranean might not have demanded much additional change. The hinterlands with their colder, wetter seasons, salty alluvial zones, and forested landscapes posed a far greater challenge, and the use of barley, sheep/goat, and upland pulses implies local modification and adaptation.

The contemporary Mediterranean landscape is changed beyond all recognition. Forest clearance since the Neolithic, Roman exploitation of hillsides for commercial production of vines, olives, and cereals, historic overexploitation, and overpopulation have all contributed to soil erosion, changed ground water levels, and badlands. The classic Mediterranean landscape of peasant agricultural exploitation, portrayed by Braudel (1972; see also Barker 1995), was probably far less productive by the sixteenth century AD than at the beginning of the Neolithic, but many features, such as unstable soils, floods, and drought, remain unchanged. Such conditions have perpetuated the seasonal use of different parts of the landscape for transhumance and upland stock farming, and lowland cereal production and settlement.

SCHOLARLY BACKGROUND

The Neolithic has been the focus of scholarly study for barely a century in most parts of the Mediterranean, but landscape approaches since World War II, along with aerial photography, survey, soil and environmental study, and a very Mediterranean tradition of culture-sequence research, have revealed most of the regional Neolithic cultures. Some areas (such as the Aegean) have been popular for research, whilst others, such as north Africa, have been largely ignored.

Dating programmes since the 1960s have revolutionized our understanding of the antiquity of the Neolithic, resulting in the ‘Wave of Advance’ model (Ammerman and Cavalli-Sforza 1971, 1973, 1984) combining evidence of genetic, linguistic, and cultural movement with an improving chronological framework. Current interests are diverse, including environmental and material approaches, alongside ‘post-processual’ studies exemplified by projects such as Çatal Höyük in central Anatolia (Hodder 1996, 2000) and phenomenological investigations (Skeates 2008; Tilley 2004, 2008). A lack of

interpretative syntheses of Neolithic archaeology, however, hinders a detailed understanding of much of the region. It is still rare to find fieldwork programmes addressing the Neolithic as a primary research goal, and few sites are examined within their wider economic landscapes, or subject to soil and seed, isotopic, population, dating, or environmental analyses. To compensate, explanatory models and simulation studies address key issues of how agricultural society spread across the region.

MESOLITHIC BACKGROUND AND NEOLITHIZATION

Despite the often insubstantial evidence for mobile hunter-gatherer groups, the Mediterranean basin and its hinterland provided rich and varied foraging landscapes—and most if not all of the landscapes and at least the larger islands were probably known, exploited, and populated to some degree long before agriculture emerged. Mobility involved terrestrial, maritime, and riverine exploitation by Mesolithic communities capable of navigation and boat-raft building, and with a wide knowledge of their land and seascapes. Given this, the questions to ask are why and how economic strategies changed, and why some communities accepted novelty and innovation whilst others remained conservative.

Changing environmental conditions almost certainly triggered change and innovation across the Near Eastern Levant (defined here as Syria, Jordan, Lebanon, Israel). The early Holocene (c. 10,000–6,000 BC) saw remarkable ecological regeneration after the dry cold of the late Pleistocene in south-west Asian and Mediterranean landscapes (Roberts 1998; Moore 1983; Moore et al. 2000). Subsistence in the particular ecozones of the Levant, physically constrained by sea, mountain, and desert (Sherratt 1996, 2005), resulted in locally dense populations (Natufians) subsisting on intensive plant collecting and selective animal herding/culling. With a sudden downturn in the climate (Younger Dryas, mid-tenth millennium BC), and with nowhere to go and diminishing economic resources, Pre-pottery Neolithic populations survived through the innovation of an entirely new approach to food procurement, processing, storage, and new products and husbandry practices (Moore and Hillman 1992). For early Neolithic populations, the eastern Mediterranean coastline (Anatolia, southern Greece, Cyprus, north Africa) offered similar environments to the Levant, but further west and north climatic seasonality became more marked, with adaptation requiring considerable change and technical innovation. Here the early Holocene climate offered a near-ideal environment for late Mesolithic hunter-gatherer economies

(Lewthwaite 1986, 1989; Pluciennik 2004, 2008) able to exploit the rich fauna and flora of the forests, lakes, estuaries, and coasts of the central and western Mediterranean. In consequence, well-established mobile traditional hunter-gatherers seemed reluctant to adopt permanent farming and settled life.

The significantly lower sea levels that persisted until c. 5000 BC promoted the movement of farming across the Mediterranean with large estuaries, large islands, and peninsulae providing extensive and connected landscapes. After c. 5000 BC sea levels rose, drowning these landscapes and reducing the useable territory. Mobile groups might have settled islands large enough to sustain hunting and gathering seasonally or permanently (cf. Dawson 2007; Malone 1999), but some areas (e.g. Cyprus, Crete, south-east Italy) adopted farming rapidly. Many forager groups lingered after farming arrived, as charted by recent surveys in the western Mediterranean uplands, islands, lake basins, coastal caves, and rock shelters (Giannitrapani and Pluciennik 2001; Malone and Stoddart 1994; Binder 2000; Zilhao 2000; Barker 1995; Biagi 1990; Pessina and Tiné 2008). A major problem for archaeologists is the location of sites documenting the transition from foraging to farming, with just a few examples currently known and published. Uzzo cave in Sicily (Costantini 1989; Pluciennik 1994; Cassoli and Tagliacozzo 1995; Mannino and Thomas 2007; Tagliacozzo 1993, 1994; Piperno et al. 1980; Tusa 1985) and Franchthi Cave in Greece (Jacobsen 1976, 1981; Hansen 1991; Payne 1975; Perlès 2001) revealed evolving subsistence strategies that included hunted or stranded marine mammals, deep-sea and inshore fish, molluscs, birds, small mammals, and plant foods. Further west, the transition seems far more gradual around, for example, the Tagus estuary in Spain, where Atlantic resources provided very different seasonal opportunities to Mediterranean rivers like the Ebro or the Rhône.

NEOLITHIC ‘ORIGINS’ IN THE NEAR EAST AND ANATOLIA

Origins for domestication and farming lie in the Levant, where the wild progenitor populations of the main European domesticates (cattle, sheep, goat, pig, wheat, barley, lentils, peas, beans, various fruits, nuts, vegetables) (Meadow 1989) were available. Studies of Natufian hunter-gatherers and their successors demonstrate that the necessary pre-adaptations towards food production took place in the twelfth to eleventh millennia BC. Intensive food collecting–processing and herding–hunting strategies at base camps such as Ain Mallaha in Israel (Valla 1995) and Abu Hureyra in Syria (Moore and Hillman

1992; Moore et al. 2000) stimulated complex forager populations. From ‘broad spectrum’ collecting and hunting, the semi-mobile and growing hunter-gatherer groups focused on specific foods (gazelle, wild goat, wild wheat, barley, pulses). Larger sedentary communities (e.g. Jericho, Abu Hureyra, Ain Gazel) developed around increasingly domesticated foods derived from intensive herding and emergent agriculture. These Pre-pottery Neolithic cultures (distinguished locally as PPNA, PPNB, and PPNC) adapted to presumed economic necessity in the tenth to ninth millennia BC (Bar Yosef 1995; Gopher 1995; Moore et al. 2000; Aurenche 2007; Hauptmann and Özdoğan 2007) through a focus on certain predictable, high-calorie/protein farmed foods and emergent technologies. From c. 8700–6500 BC, this economic model consolidated and expanded across the Near East and east Mediterranean coasts. The original ‘Wave of Advance’ model suggested a steady, almost measured expansion north and west from the heartland of the Levant coast. Recent chronologies show a much more haphazard pattern (Guilaine, this volume; 2007) whereby some parts of Europe adopted Neolithic elements more rapidly than others, the economy and settlement funnelled along particular rivers, plains, coasts, and local communities. This pattern is suggested in Fig. 9.1, which combines both ‘waves’ and current dates within the broad cultural attributions of the earlier Neolithic.

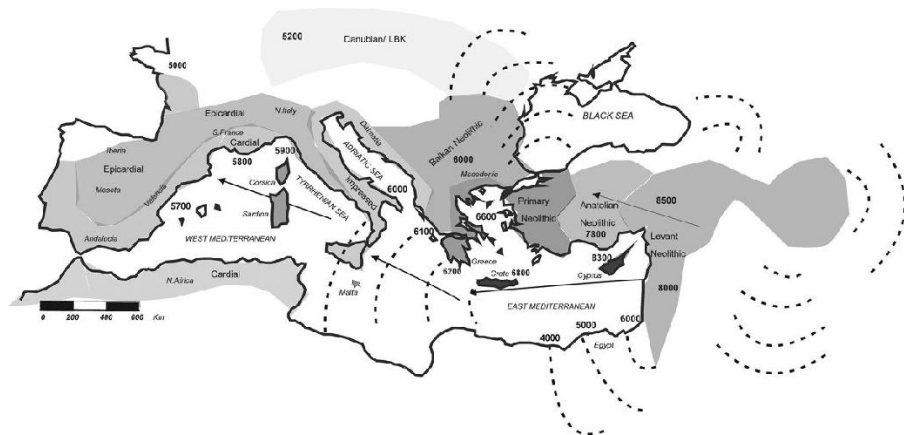


FIG. 9.1. Map of a modified ‘wave of advance’ in 200-km arcs, showing the expansion of Neolithic farming and culture into the Mediterranean with additional radiometric dates and broad ceramic groups (after Özdoğan in Hauptmann and Özdoğan 2007; Guilaine 2007).

Two repeating elements contribute to the distinctive pattern of Neolithic spread and acculturation across the Mediterranean: colonization by exotic peoples, foods, technologies, and ideas; and continuity of indigenous foragers and traditional subsistence strategies

(Zvelebil and Rowley-Conwy 1986). The former is seen as sophisticated, settled, and agricultural, the latter as mobile, small-scale, and culturally simple. Probably both are extremes of reality. The speed and success of Mediterranean Neolithization is down to well-adapted, opportunistic hunter-gatherers selecting elements from the Neolithic ‘package’ to suit their economic needs, social aspirations, and local environment. Given that the original transformation within the Levantine–east Mediterranean involved internally stimulated economic and cultural change, we can apply a version of this ‘indigenous’ model to the Mediterranean, albeit with the introduction of domesticates and some technologies.

Key elements of the primary Neolithic package transmitted from the Near East into south-east Europe and beyond were domestic species and ideas and technologies of how to live, build, make, eat, and cultivate. Mud-brick and daub houses (Flannery 1969), larger social groups, ground stone implements and vessels, pottery and plastic figurative ‘art’ and imagery, and new materials such as obsidian were some of the attractions to indigenous groups. So was the novelty of cereal foods, and the potential to store them. These prestige foods may have provoked new beliefs, social values, and competition (Mithen 2003, 62–71), resulting in elaborate ritual and building programmes. The impressive ritual site of Göbekli Tepe (Schmidt 2007) in south-east Anatolia, with its artistic focus on wild and hunted creatures, may represent those new values. In essence, cultivated foods were prestigious and part of elaborate ritual and ceremony celebrating both the wild and the cultivated—this underpins the adoption of otherwise arduous farming and land tenure amongst former foragers.

NEOLITHIC EVIDENCE IN THE MEDITERRANEAN

In spite of the momentous changes the transition to agriculture implies, physical evidence of that transformation is far more ephemeral and difficult to assess. At its most basic, Neolithic evidence comprises some four categories: economic (plants, animals, technical innovations); structural (settlements, houses, tombs, burials); material culture (pottery, tools); and, finally, the elusive changes to the wider environment, with soil, pollen, and environmental records documenting clearance and crop regimes (Barker 2006; Van Andel and Runnels 1995). Environmental evidence occurs episodically, and rarely does it provide the full picture of transformation, except when documented over centuries or millennia of activity in deeply stratified sites.

Economic evidence

Some recent research has shown the complexities of the evolving Neolithic economies of the Mediterranean, but there are few sites where routine environmental or dating studies have been conducted. Too often, pottery and stratigraphic lists take the place of a better understanding of the environment, landscape, and chronology of individual sites. Current questions include the role of local plants and animals in the process of domestication (e.g. pigs and cattle), the role of pastoralism, secondary products, dairying, isotope studies and diet, plant and animal genetics, and the role of hunted and collected food within the mixed yet increasingly agricultural economies of the region ([Barker 2006](#)). Studies rarely show the rate of change or the persistence of continuing systems, although this remains a fundamental aspect.

Settlement and regional culture

The definition of settlement remains tricky given that so few complete or substantial sites have been excavated across the region. Far more common are fragmentary occupation traces underlying later open sites, comprising pits, post holes, walls, hearths, rubbish, burials, and material culture. Cave and rock shelter occupations often include layers with Neolithic materials, but are difficult to interpret. Exceptions include the Neolithic tell sites of western Anatolia ([Mellaart 1967, 1971](#); [Özdoğan 1999](#)) Bulgaria, and Thessaly, and the Neolithic ditched sites at Makriyalos (Greece) ([Halstead 1999](#); [Pappa and Besios 1999](#)), the Tavoliere (south-east Italy), the Catania Plain (Sicily), and Valencia (Spain), but estimates of population density, settlement size, family group size, and so on remain obscure, as do the different functions of such sites. Surveys in the Acconia Plain in Calabria ([Ammerman 1985](#)), the Gubbio Valley in Umbria ([Malone and Stoddart 1992, 1994](#)), Calabria ([Robb 2007](#)), Thessaly ([Perlès 1999](#)), or eastern Crete ([Tomkins 2008](#)) give important insights into the elusive nature of early and developing Neolithic settlement, but it is easy to over-interpret what at best is flimsy evidence ([Halstead 1999](#), 80–81).

Burials and tombs

Early burials reflect the Near-Eastern emphasis on house association, with burials placed below floors, within ditches, or in storage pits, hearths, and other domestic structures. Formal burial in defined places, such as the ubiquitous rock cut tombs of much of the

Mediterranean, developed c. 4500–4000 BC and became frequent in areas of suitable geology across the region, sometimes dominating burial practice until the protohistoric period. Megalithic and other stone-built structures similarly became a feature of many Mediterranean areas from the Levant to Portugal, and there has been much debate as to their origins, dates, and cultures. Until the late Neolithic, burials were sparsely furnished with grave goods (e.g. Çatal Höyük; Mellaart 1967), and pottery, personal ornaments, stone tools, and food were the main offerings. By the end of the fourth millennium BC, some tombs were well furnished, implying emerging social hierarchy, but the trend was for communal grave goods and collective burial. Individual burials dominated in some places, especially where associated with houses or caves, whilst megalithic and rock-cut tombs, given the necessary investment, involved larger numbers of people and collective rites. However, few sites were excavated or recorded properly. Only recently have detailed studies of bones, tomb contents, and locations begun to reveal the complexity of funerary practice.

Pottery

Pottery emerged some time after farming in the eastern Mediterranean, but often was the first signal of Neolithic change in the west (Table 9.1). Thus pottery cannot be considered a key marker of Neolithization, but a commodity within it. Earlier scholarship used pots to define people or their cultures, but now function, value, style, residues, material, technology, and so on are significant approaches.

Table 9.1 Pottery emergence across the Mediterranean, indicating some of the earliest dated pottery sites.

Region	Siberia	France	W. Med. islands (Sardinia, Corsica, Balearics, Sicily)	Italy	Balkans	Greece	Anatolia	Levant	Egypt-North Africa
Earliest dates	mid 6th mill. bc Cardial-Epi-Cardial	mid 6th mill. bc Cardial then Epi-Cardial	6th mill. bc Cardial	6th mill. bc Impressed in E, Cardial in W, red painted, scratched	6th mill. bc Cardial, Impressed and painted and Danilo wares	7th mill. bc Plain and painted, Sesklo wares	7th mill. bc Plain and then painted wares	10th to 8th mill. bc first ceramics Early 7th mill. bc fully fired ceramics, plain, then painted	Early 5th mill. bc North Egypt delta, 4th mill. bc Inland 5th to 4th mill. bc Incised Impressed combed pottery
Sites	5900–5500 bc Cuartillas-Almería La Draga Catalonia Cova de l'Or-Alicante Cueva de Cendres-Alicante La Draga-Catalonia	6000–5500 bc Southern France-Liguria Arenne Cardial Grotte Gazel Libréproux Jean Cros	Corsica c. 6000–5500 bc Sardinia Cardial c. 5500 bc Sicily c. 6000 bc Uzzu	SE Italy c. 6000 bc Marche Gudjia 1 Southern Italy c. 5300 bc N Italy c. 5300–4500 bc	Konispol, Athena c. 6000 bc; Gudjia 1 Southern Dalmatia c. 5800 bc Vizula, Istria c. 5560 bc	c. 6500–6000 bc Knossos c. 6300 Nea Nikomedia c. 6400 bc Achilleion c. 6300–6100 bc Franchthi Cave mid 7th mill. bc Cyprus-Sotira 6th mill. bc	Çatal Höyük c. 6500 bc Ulucakand c. 6400–5900 bc Ilıcilar Ilıncı, Karagaçtepe, Çoğuktepe, Kuruçay	Murelibet Syria c. 9500 bc Tell Sabi Abyad III Syria c. 6300–6800 cal. bc	Merimde, Kom Saïb Lower Egypt c. 5200–4000 Hemamieh Middle Egypt c. 5000–3500 bc Chafarinas Islands Morocco c. 4400–4100 bc Hassi Quesza Morocco 5600–5100 bc
Reference	Zilhao 2000; Chapman 2008	Binder 2000	Malone 2003; Costa et al. 2003	Malone 2003; Pucienik and Zvelebil 2003	Forenbeher and Miracle 2004	Perles 2001 Swiney 2001	Takaoglu 2005; Ozdoğan 1998; 95–99 1999; 2005	Perles 2001, 95–99	Barker 2006 Hoffman 1991 Belliver Gardio et al. 2003

The presence of pottery in the western Mediterranean implies Mesolithic acquisition, rather than production (Binder 2000; Barnett

2000; Perlès 2001, 108; Whittle 1996). Ceramics may have moved as gift and food containers between incoming colonizing farming groups and indigenous populations during a slow filtering process of acculturation (e.g. Lewthwaite 1982, 1985, 1989). Selected items crossed the frontier between farming and indigenous groups, such as fine Cardial decorated pottery. Pottery, amongst other commodities, symbolized the prestige defining the food and feast of the incomers and lured indigenous locals into new social interaction and value systems. Pottery soon reflected local identities and cultural styles through distinctive forms (e.g. handles, footed vessels, painted, scratched, or modelled decoration). Modelled forms and ritual symbolism became distinctive in the Balkans and Malta (Trump and Cilia 2002), whilst elaborate decorative vessels circulated locally and more distantly in complex exchange networks anticipating later Neolithic–Eneolithic networks.

Lithics

Neolithic blade technology (longer, wider flakes suitable for pressure flaking) and polished and ground flint and hard stone tools (axes, adzes, and chisels, hollowed ground stone vessels) were distinctive innovations. Flint mines such as those at Defensola (Gargano), Monti Lessini (northern Italy), and Casa Montero (central Spain) imply organized early large-scale exploitation in the sixth to fifth millennia. Complex exchange networks moved utilitarian and prestige materials and objects over great distances, most famously with island obsidian (from Melos, Lipari, Pantelleria, Sardinia, and Palmarola), for several millennia. Exploitation began before Neolithic influence on Melos (as attested at Franchthi Cave, Perlès 2001, 36) and possibly also on Lipari.

Regional developments

Anatolia was a principal filter for Neolithic economic and technological knowledge in the eighth to seventh millennia BC. Pottery, obsidian use, cattle, mud-brick and other building methods, figurative art, and social complexity were all transmitted to the Aegean and Balkan zones. Cyprus, exploited by hunter-gatherers from the tenth millennium BC, was settled by the mid-ninth millennium BC and is the first island documenting the importation of domesticates (Peltenburg 2004; Peltenburg et al. 2001). Its combination of Levantine and Anatolian elements suggest settlers from these areas. The Aegean and Balkans represent the first major footholds for

farming within mainland Europe, transferred via western Anatolia and Thrace (Özdoğan 1998). Crete (Isaakidou and Tomkins 2008), in parallel to Cyprus, shows earlier exploitation, an aceramic Neolithic settlement phase at Knossos, and indigenous developments at several sites from as early as 7000 BC. Island hopping and settlement then became a regular pattern across the Aegean, the Adriatic, and the western Mediterranean, spreading some Neolithic elements quite rapidly—new technologies (pottery especially) travelled to the far west of the Mediterranean within a millennium of first appearing—but the dating of these earliest maritime expeditions still needs chronological investigation. Island size and proximity are important factors in the early access and exploitation of otherwise vulnerable new territories (Cherry 1981, 1990; Broodbank 1999, 2000, 2008), and Mesolithic exploitation of obsidian on Melos, and the hunting of indigenous fauna on Sardinia and Corsica (Costa et al. 2003), imply many islands were known before Neolithic colonists ventured west.

The extensive lowlands of the south-eastern Balkans were ideal for farming, and across Thessaly and Macedonia dense lake-focused tell settlement developed (Perlès 2001). House-building techniques, although derived from the Levant and Anatolia, were adapted to the different conditions, resulting in smaller, rectangular mud/wattle structures with pitched roofs. Inland and upland zones of the Balkans and western Europe, with their harsher climatic conditions, longer winter seasons, higher rainfall, and rocky mountainous terrain to which Levantine species and lifestyle were unsuited, meant low returns and poor reliability. This resulted in a dual model of adaptation and Neolithization west and north of southern Greece and across south-western Europe. This zone may be further divided between the prime agricultural alluvial, coastal, and riverine lands of early permanent Neolithic settlement, which attracted colonization by farmers as the population grew, and the uplands (Pindos, Alps, Apennines, Massif Central, Pyrenees, Meseta, Atlas). In addition, productive traditional landscapes (lakes, forests, estuaries) retained a strong Mesolithic presence long after farming communities became established. These communities obtained Neolithic elements from settled neighbours, such as incised and painted pottery, and adopted sheep/goat pastoralism and perhaps marriage partners, alongside hunting and foraging. Direct colonization is likely between the Dalmatian coast and southern Italy, bearing Balkan-style pottery, domestic plants, and animals. This movement into the central Mediterranean clearly influenced indigenous groups as far away as north Sicily and Liguria by c. 6000 BC, with pottery in Mesolithic caves such as Uzzo, Arene Candide, and Praia a Mare (Maggi 1997). In the main settlement zones, substantial ditched settlements developed on

the Apulian Tavoliere by the early sixth millennium BC and in east Sicily by the mid-sixth millennium BC ([Malone 2003](#)). Ephemeral settlement soon extended across southern and central Italy and Sicily, displacing or absorbing indigenous communities, with mixed farming and pottery at sites like San Marco in Umbria. The process of adoption became slower and was resisted for longer by indigenous groups in the Po Valley, the Alpine fringe, and southern France (c. 5900–5500 BC), where fishing, hunting, and gathering persisted alongside new semi-permanent settlement and Neolithic elements (especially Cardial pottery and ovicaprids, [Binder 2000](#)). A dual economy is evidenced by cereals at Aberador cave in Languedoc and by sheep/goat at Grotte de Gazel, Azzura Cave, and Château-Les-Martigues ([Geddes 1983](#)).

Mediterranean Spain offered different conditions and the ‘dual model’ of colonization and indigenous Mesolithic occupation certainly applies ([Chapman 2008](#), 16; [Bernabeu 2002](#)). Large estuaries (e.g. the Ebro) and coastal areas provided ideal Mesolithic resources at sites such as Cova de l’Or and Covade Les Cendres ([Bernabeu 1989](#)), whilst dense settlement and intensive ‘garden’ cultivation developed in ‘empty’ parts of coastal Valencia. Further south a more mobile pattern of small settlements, as shown by survey in the Ronda basin, exploited a combination of wild and grown foods. The harsh conditions of the Meseta delayed Neolithic settlement until c. 5000 BC, evident first in caves, then open sites like Los Barruecos. Much of the region may have been sparsely populated ([Zilhao 1993](#); [2000](#), 144–145) until agriculture became fully established.

The introduction of agriculture to Sardinia, Corsica, and the Balearic islands implies colonization by maritime groups. Mesolithic prospection of the two large islands may begin as early as the eighth to seventh millennia BC, but pottery and domesticates date only from the early sixth millennium BC, implying a slow adoption of farming and settlement (e.g. the cave of Filiestru in north-west Sardinia, [Trump et al. 1983](#); and Basi in Corsica had pottery and domesticates). The much smaller and more remote Balearic islands show no human activity before the late fifth/early fourth millennia BC. The pattern of Neolithic spread, adoption, indigenous transformation, colonization, isolation, connectivity, and inter-connectivity across land and seascapes remains an active area of discussion, where no one explanation explains the enormous regional complexity, and long-lived Mesolithic practices still challenge established ideas about colonists from the east ([Barker 2005](#); [Cherry 1981, 1990](#); [Rainbird 1999](#)).

The southern rim of the Mediterranean, normally disregarded by European prehistory, also absorbed elements of Neolithic economy and culture. Fringed by the Sahara and the dry Atlas mountains, only

the coastal zone could sustain farming or dense populations. In spite of the proximity of early domesticates in the Levant, groups in Egypt only adopted domesticates, herding, and cultivation alongside hunting and fishing in the early fifth millennium BC at Nile delta sites like Merimde and a millennium later at Hemamieh, further south (Hassan 1998; Barker 2006, 292). A 'pastoral Neolithic' (Barich 1987) dominated along the coast of north Africa and the Maghreb, with herding and intensive management of wild Barbary sheep, cattle, gazelle, and hartebeest in the earlier Holocene (Smith 1998). The recently surveyed Tadrat Acacus of south-west Libya (Barker 2006, 294–300) produced Neolithic pottery, lithics, and cave shelters. Abundant rock art in areas now desert attests to the short episode of economic opportunity between c. 6000 and 4000 BC, when the climate was optimally suited to a Neolithic way of life. Pastoralism rather than foraging/hunting and cultivating may actually have been a response to growing aridity that made cultivation unreliable. Indeed, the mobile economy solution, much as recorded by Braudel (1972) millennia later, was the subsistence strategy most suited to the marginal zones of the Mediterranean over its long history.

ORIGINS AND MODELS

Numerous publications have explored the general theme of economic and social change fundamental to Neolithization (e.g. Cowan and Watson 1992; Gebauer and Price 1992; Harris 1996) and presented models of varying relevance to the Mediterranean region. Theoretical interest is always on the original locations of domestication, not the secondary ones like the Mediterranean. Here the subtle processes that slowly transformed the region from foraging to agriculture have not been effectively addressed by explicit explanatory models. Figure 9.2 summarizes stages of economic transformation identified by recent researchers. Current approaches favour multistranded cause and effect models, applying a combination of environmental and social factors to the problem of understanding, although not necessarily explaining, Neolithic adoption and change.

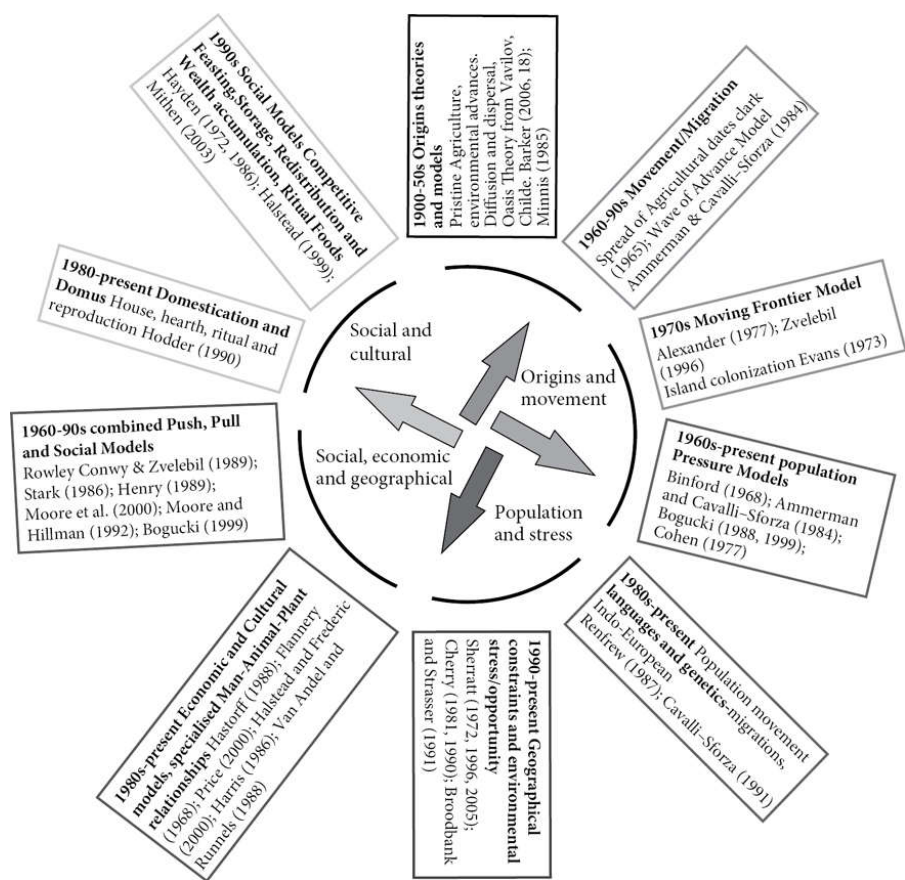


FIG. 9.2. Diagram summarizing explanatory models for the spread of farming.

Explanatory models for the spread of farming employ environment, population, technological innovation, colonization–migration, and social models (Fig. 9.2). Population pressure on resources triggering an economic response towards intensification of food procurement has long been identified as a likely factor. So has environmental change, which might generate the same response or result in genetic mutation and new food opportunities from modified plants and animals. Both factors can lead to migration, invention, and social–economic change. More recent ideas, borrowing from anthropology, have examined the role of social pressure and competition, emulation, prestige feasting, novelty, ritual consumption, and the role of the home/domus in sedentism and changing ideas about food.

Interest in the origins of plants, animals, and farming in the early twentieth century generated important debate that became active in the 1950s–60s with the possibilities of absolute dating. [Grahame Clark's \(1965\)](#) original model plotted new 14C dates for the earliest occurrence of domestic plants and animals on the map of the

Mediterranean and Europe. The 'Wave of Advance' model (Ammerman and Cavalli-Sforza 1971, 1973, 1984) expanded this idea and is still being modified as new data come to light (Guilaine 2007, 171; Schmidt 2007; Zeder 2008). Renfrew added the origins of languages (Renfrew 1987; see Shennan, this volume) to this emerging spatial approach, implying that farming and population movement were the trigger to Indo-European language migration. Other cultural elements have been easier to plot, and forms of pottery and houses, lithic technologies, and raw materials may collectively imply a specific 'cultural' identity. Some models seek to explain how and why populations colonize new territory and cross social and economic frontiers (Alexander 1977), including biogeographical approaches relating to island colonization, population densities, size, and distance (Cherry 1981; 1990; Broodbank and Strasser 1991; Rainbird 1999). Islands hold particular interest for archaeological models, given their defined space and identity. John Evans (1973) recognized the usefulness of this approach to Mediterranean islands, suggesting they were 'laboratories' for exploring social change, an idea developed by fieldwork on, for example, Malta, Sardinia, Sicily, Crete, and Cyprus.

Current approaches aim to go beyond simply charting distance, maritime abilities, or even availability of new foods by exploring the many social and cultural factors in the world of Mesolithic–Neolithic peoples. The take-up of new ideas, values, foods, and emerging social organization was reflected in the continued development of distinctive Neolithic societies over the succeeding millennia. These post-processual approaches have examined how status foods and competitive feasting, 'elite dominance', or indigenous responses (e.g. Hayden 1992) might have encouraged communities to add innovations to their cultural and economic repertoire, as well as forming a distinctive Neolithic (and Mediterranean) civilization. In the eastern Mediterranean, settlement itself may have marked the boundary between indigenous and colonist, as defined village concentrations appeared. But as the sense of place and tight community became more diffuse the further west one travelled, other markers became significant in defining identities and origins. In the west Mediterranean, large monuments, whilst mostly intended for burial of ancestors, also marked the different identity between farmers, semi-farmers, pastoralists, and transforming indigenous groups. These identities ultimately shaped the long-term development of the very distinctive regional Neolithic cultures populating the Mediterranean for the next three millennia, also influencing neighbouring northern, western, and central Europe.

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CHAPTER 10

EARLY NEOLITHIC MANIFESTATIONS IN CENTRAL AND EASTERN EUROPE*

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INTRODUCTION

AFTER Childe (1936), the concept of the ‘Neolithic revolution’ was focused on the introduction of agriculture. Neolithization was viewed as the spread of colonists bearing ceramic containers, domesticated plants and animals, new architecture, long-distance trade, burial rituals, and eventually forcing indigenous hunter-gatherers into adopting the cultivation of domesticated cereals and the rearing of animal stock. Additional criteria included increased sedentism, social hierarchy, and symbolic expressions. To this day the shift to agropastoral farming is deemed the most important single signature of the Neolithic (Zvelebil 2000).

Yet recently, it has become increasingly clear that the distinction between an agricultural and non-agricultural Neolithic is never absolute, and the dominant manifestations of the Neolithic vary within Europe (Dolukhanov et al. 2005; Gronenborn 2010). Thomas (2003) argues against the concept of a fixed and universal ‘Neolithic package’ and views the Neolithic as a range of various processes, generating considerable variability of subsistence practices. Similar views remain popular amongst scholars in the former USSR who identified the ‘Neolithic culture’ with hunting-gathering communities manifesting a sedentary way of life and large-scale production and use of ceramic ware, polished stone, and bone tools (Oshibkina 1996). Here, pottery becomes the key marker of the Neolithic. Still, though, several writers express scepticism about the relevance of pottery as the prime Neolithic indicator, viewing it rather as a commodity, or as prestige items intended to ‘lure indigenous locals into a new social interaction and value system’ (Malone, this volume).

The present chapter discusses the emergence of the Neolithic in two distinct, albeit not contrasting, regions of Europe: its central part and its eastern part. The former encompasses the Carpathian basin and the

central European low mountain ranges with the loess landscapes. The Rhine, Danube, and Elbe river basins form the hydrological axes of that area. Eastern Europe stretches from the eastern Polish bog and woodland plains to the Russian forest and steppe belts up to the Urals. Both regions are connected through the northern European lowlands. These contrasting environments form the basis for a discussion of farming and non-farming Neolithic lifestyles.

ENVIRONMENTS

The western extension of central Europe is marked by the Ardennes and the Vosges mountain ranges, the eastern fringes by the Great Hungarian Plain and the Polish bog and woodland plains. Towards the south, central Europe is delineated by the Alps, towards the north by the North Sea and Baltic coastal plains. Central Europe is divided into three major geographical entities, namely the northern plain, the central mountain ranges, and, towards the south, the Alpine slopes and the northern Alps. These landscapes are drained by south–north flowing river systems (Rhine, Weser, Elbe, Odra, Vistula) and the west–east oriented system of the Danube. Wooded low mountain ranges in the central part interchange with extensive and fertile loess plains.

Eastern Europe opens up to the east European plain. It includes the Pontic depression, a gigantic trough or foreland tilted towards the Black Sea. The plain is incised by the terraced valleys of major rivers (the Prut, Dniepr, Southern Bug, and Don), often with well-developed estuaries; in some places the loess cover reaches 200m in depth. The river Volga and the impressive North Caspian lowland, lying below sea level, constitute the eastern edge and lead into the Asian steppes and deserts.

Air-mass circulation provides the key for the physical–geographical peculiarities of both regions. The western area is dominated by moist Atlantic air masses, whilst the east remains controlled by the Siberian and Arctic systems and features chiefly a continental-type climate, with central Europe taking up an intermediate position. Accordingly, one encounters temperate broad-leaved woodland in the west, as opposed to the forest-steppe and treeless steppe in the east. Loess and sandy soils are common in the west ([Lang 1994](#)). The soils in the steppes and forest-steppes include the *chernozem* (or ‘black earth’), which are the richest in Europe ([Haase et al. 2007](#)). Notwithstanding their natural fertility, the southern Russian steppe and forest-steppe, prone to droughts, were always high-risk areas in the agricultural sense.

There is little doubt that the distinction in the environment had a profound effect on subsistence and sociopolitical dynamics. An agricultural economy could be established and sustained only in the regions with suitable natural resources and, first and foremost, agro-climatic potential, i.e. the combination of fertile, easily arable soils, precipitation, and temperature. Thus, central Europe and the southern Russian steppe zones experienced the first shift to farming during the later seventh and throughout the fifth millennium, whilst in the central European northern plain hunting, fishing, and gathering remained the dominant economy until 4000–3800 BC. In north-western Russia the first clear signals of agricultural impact on the vegetation are noted at 2700–2000 BC.

CENTRAL EUROPE

Early horticulture and herding

Farming appears in Europe around 7000 BC on Crete ([Efstratiou et al. 2004](#)) and on the Thessalian plain around 6500 BC ([Reingruber 2008](#)). The new economy reaches the northern Balkans and the middle Danube basin with Karanovo I-II (6100 to 5800 BC) in Bulgaria, and Starčevo-Körös-Criș in the Carpathian Basin (5900–5500 BC). When, however, farming arrived in central Europe is still a matter of intensive debate ([Behre 2007](#)). It is apparent that during the seventh millennium central European late Mesolithic societies were in intensive contact with groups on the Balkan Peninsula and Greece. This evidence so far consists of snails from the Danube, southern France, and the Atlantic coast ([Gronenborn 1999](#); [Álvarez Fernández 2003](#); [Lenneis 2010](#)). Furthermore, the site of Arconciel/La Souche in the Swiss Mittelland has recently produced a clay stamp, a *pintadera*, which resembles south-east European forms ([Mauvilly et al. 2008](#)). The snails and the *pintadera* may be understood as archaeological reflections of continuously operating long-distance networks. Whilst most of the archaeological evidence dates to the later centuries of the seventh millennium, palaeobotanical evidence for possible south-eastern contacts in the form of cereal pollen, *Plantago lanceolata*, and other weeds already starts at 6700 BC, with the beginning of the late Mesolithic industries in southern central Europe ([Tinner et al. 2007](#)). This evidence does not prove the practice of cereal horticulture among otherwise forager groups beyond any doubt, but does suggest its possibility. In any case, remains of domestic animals—apart from dog—have not been recovered.

Domestic animals do appear in western central Europe around 5600 BC, together with a pottery tradition with stylistic links to southern France. This shows that the late Mesolithic networks of the seventh millennium had been in operation for many centuries and might have facilitated the spread of pottery and domestic animals from coastal settlers up along the Rhône (Fig. 10.1c). This pottery tradition is called La Hoguette after its first accidental discovery at a site in Normandy (Jeunesse 2006). La Hoguette pottery is associated with cereals and domestic animals at the rock shelter site of Bavans in the Doubs valley and also at Stuttgart-Bad Cannstatt (Kalis et al. 2001). It is also present on sites of the earliest phase of the Linear Pottery culture. Currently, the La Hoguette tradition is interpreted as manifestations of pastoral groups of a transitional stage between forager and farmer economies, with sheep/goat herding and maybe small-scale horticulture (Gronenborn 2007).

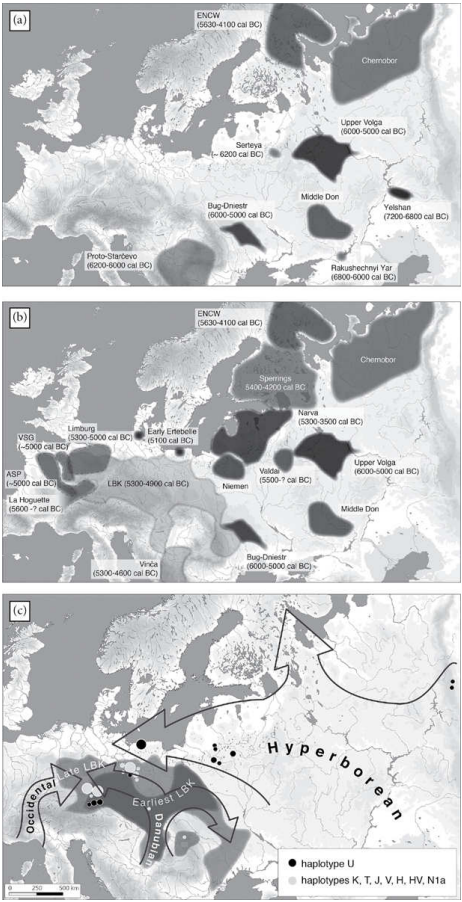


FIG. 10.1. The spread of the Neolithic in western Eurasia. a) Early Atlantic, b) Middle Atlantic, c) the three streams of Neolithization and the palaeogenetic

map of the early Holocene (after [Bramanti et al. 2009](#); [Gronenborn 2009b, 2011](#)).

The Linearbandkeramik

These forager-pastoralists were in intensive contacts with Linear Pottery culture farmers (German Linearbandkeramik—LBK) who had, by the mid-sixth millennium BC, settled a vast area of the temperate European loess belt from Transdanubia, their apparent area of origin, to the Rhine in the west and to western Ukraine in the east ([Fig. 10.1b](#)). LBK expansion occurred in shifts. To the west the earliest phase reached up to the Rhine around 5400 BC, with later phases further west until the terminal phase became finally established in the Paris Basin around 5000 BC. The northern Pontic lowland forms the easternmost extension of LBK sites with a fully fledged farming economy. A considerable number of sites exist in the river basins of the upper and middle Dniestr, the Prut, and the Reut ([Larina 2009](#)). Mainova Balka, a settlement in the Southern Bug basin north of Odessa with typical LBK ‘music note’ pottery, is the easternmost site of this type ([Sapozhnikov and Sapozhnikova 2008](#)).

LBK economy was based on farming, with emmer, einkorn, lentils, and peas being the major crops ([Kreuz 2007, 2010](#); [Bogaard 2004](#)) and cattle, sheep/goat, pig, and dog the domesticated animals. It has, in recent years, also become clear through archaeogenetic analyses that apart from dog, all early Neolithic domestic stock originated in the Near East ([Edwards et al. 2007](#); [Larson et al. 2007](#)).

LBK farmsteads were composed of longhouses, seemingly inhabited by lineages of different cultural traditions ([Lüning 2005](#); [Strien 2005](#); [Gronenborn 2007](#)). At Vaihingen, south-west Germany, [Strien \(2005\)](#) could distinguish four sections or wards which persisted throughout the duration of the settlement for several hundred years. These sections differed in material culture components such as pottery decoration, but also in lithic artefacts such as arrowhead types. Earliest LBK settlements were few in number and the considerable distances between them were spanned by vast networks, the one distributing Szentgál radiolarite being the most extensive ([Mateiciucová 2010](#)).

Around 5350 BC, LBK societies underwent a transformation with changes in pottery decoration and architecture. Around the same time new territories were settled, like the Rhineland and Alsace in the west, but also the basins of the upper and middle Dniestr, the Prut, and the Reut in the east ([Larina 2009](#)). Now the LBK decoration style began to split first into two broad regional traditions, the band-based ‘Flomborn’ style in the west and the line-based ‘music-note’ style in

the east (Fig. 10.2). Regional fine-grained settlement analyses show that the number of sites rises, which indicates a population increase (e.g. Zimmermann 2003; Nauk et al. 2006).

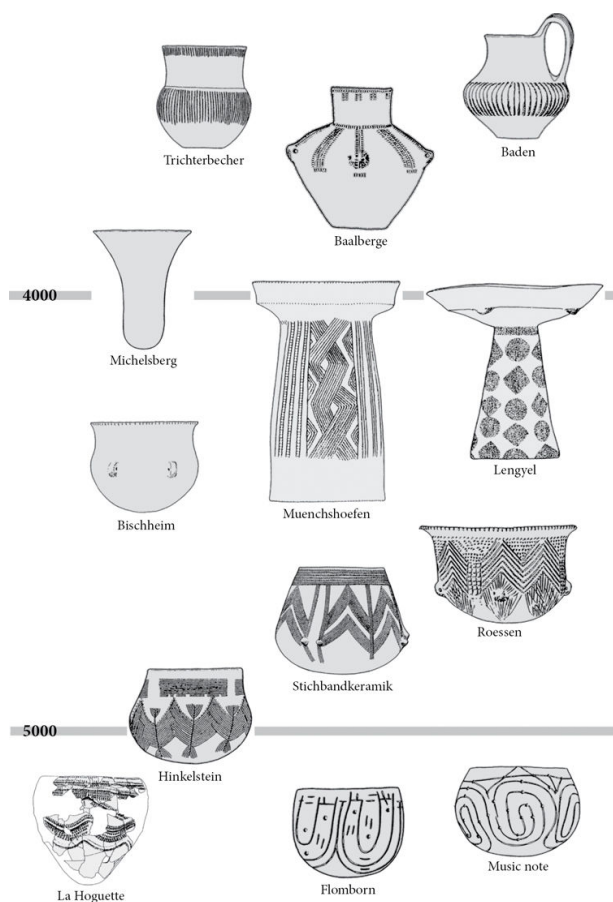


FIG. 10.2. Neolithic cultures in central Europe (the ceramic vessels are not to scale; after Preuss 1996).

After another two hundred years of continuous settlement growth and further expansions westward into the Hesbaye in Belgium and the Aisne Valley in France, the LBK reaches its climax with densely occupied settlement clusters. Around 5100 BC, LBK societies in the west drift into a period of crisis which manifests itself through several sites with indications of violent conflicts, such as Menneville in the Aisne Valley (Farruggia 2002), Talheim, or Schletz (Wild et al. 2004). Boulestin et al. (2009) argue that some sort of intensive cannibalism was practised at the site of Herxheim in the upper Rhine valley. However, what exactly happened during the fiftieth century BC in the western parts of the LBK oikumene is still unclear. Palaeoclimatic studies show that conditions changed from rather wet to rather dry

around 5150 BC and the latest LBK sites appear in upland regions which today would not be settled by farmsteads (Strien and Gronenborn 2005; Gronenborn 2007).

The middle Neolithic and the early Eneolithic

By 5000 BC the LBK had vanished across southern central Europe and given way to middle Neolithic cultures such as Hinkelstein and Großgartach in the west, Stichbandkeramik (STK) in the central areas, and Lengyel in eastern and south-eastern central Europe (Jeunesse and Strien 2009; Zápotocká 2007; Pavúk 2007). The longhouse tradition persisted into the new millennium (see Last; Coudart, this volume), but sites are now more concentrated. New phenomena in eastern central Europe are the so-called roundels (German *Kreisgrabenanlagen*), circular ditch systems which apparently served as ritual centres for village communities (see Petrasch, this volume).

In western central Europe long barrows, similar to those observed in the Paris Basin in the Cerny group (Duhamel and Mordant 1997), have recently also been found in the middle Neolithic Großgartach culture (Schade-Lindig 2008). This shows that during the first few centuries of the fifth millennium BC central European societies experience sociopolitical changes, although they still persist in a Danubian tradition. The subsequent Rössen culture dominates the period between 4800 and 4600 BC, with extensions into the Paris Basin. Characteristic for Rössen are trapezoidal houses forming small hamlets, sometimes surrounded by enclosures. Hilltops are settled for the first time. Burials are mostly extended and oriented north–south (Lönne 2003; Dammers 2003).

In eastern central Europe, the Lengyel culture evolves out of the western Carpathian Basin around 5000 BC (Pavúk 1998, 2007). Lengyel is not only associated with roundels and complex enclosure systems (Pavúk 1991; Trnka 2005), but also with richly furnished burials such as from the site of Lengyel itself (Wosinsky 1888) or Aszód (Kalicz 1985). As in the west, social differentiation becomes evident; this may also be inferred for the site of Polgár-Csőszhalom (Anders and Gyöngyvér Nagy 2007). Among the burial goods are copper artefacts, indicating the advent of a novel technology for central Europe. Copper had first been used in south-east Europe during Vinča B, as dates from the Rudna Glava mine indicate (Jovanović 1996). During the mid-fifth millennium, the new technology reaches central Europe with the horizon of the Bischheim and Münchshöfen culture groups. One central European copper extraction and smelting site was identified at Brixlegg near Innsbruck in the Austrian Alps (Bartelheim et al. 2002). At the same time,

jadeite and eclogite were beginning to be mined in Alpine sources, made into axeheads then transported over great distance across western Europe. Axeheads of the Bégude type were reshaped in Morbihan in southern Brittany and then transported eastwards into Germany and to the southern British coast (Pétrequin et al. 2008). The region around Carnac may have become a centre of considerable ritual and political power with a sphere of influence reaching deep into central Europe, similar to the role of Varna for eastern Europe (Pétrequin et al. 2010).

With the appearance of Bischheim in the west and Münchshofen further east, social, political, and economic changes seem to have occurred across central Europe. Settlements are now aligned along pre-planned streets. These arrangements are particularly well documented in wetland sites, such as Aichbühl or Hornstaad, which appear at this time (Schlichtherle 2004; ‘Lakeside Dwellings of the Circum-Alpine Region’ by Menotti). Changes are also evident in pottery, as decoration decreases. Contacts between southern central Europe and the northern plains now intensify and after 4000 BC the first domesticates appear in the European north. Possibly the expansion of the Michelsberg culture has an influence on this northward shift of the Neolithic (Klassen 2004; Czerniak 2007). With Michelsberg and the now emergent Funnel Beaker culture (German *Trichterbecherkultur*, TRB) in northern central Europe, the second shift in the process of Neolithization in central Europe commences (Gronenborn 2009a; Schier 2009).

Michelsberg (4400–3500 BC) is rooted in the Paris Basin, from where it expanded eastwards towards the Rhineland and Westphalia and ultimately to Sachsen-Anhalt, but also to south-western Germany as far as Lake Constance (Seidel and Jeunesse 2000; Geschwinde and Raetzl-Fabian 2009). Sites in the Rhineland and the Neuwied Basin disappear around the thirty-eighth/thirty-seventh century BC, possibly during a crisis period (Arbogast et al. 2006), but persist further south until around 3500 BC.

Landscape use has completely changed from the preceding middle Neolithic, with higher altitudes settled, and the establishment of extensive hillforts and large enclosures. Many of these enclosures constituted defence systems, maybe marking sites of regional political importance. Open villages and hamlets surrounding the enclosed centres were short-lived and often relocated (Matuschik 1991; Seidel 2008). Unfortunately, the Michelsberg culture has produced only irregular burials of individuals deposited in ditches and reused storage pits (Wahl 2008). More common modes of treating the dead have disappeared from the archaeological record. The exceptionally preserved evidence from Beaurieux in the Aisne Valley shows long

barrows for single individuals in richly furnished and elaborate burials (Colas et al. 2007), perhaps indicating a certain degree of sociopolitical stratification. Michelsberg also witnesses the emergence of sites of enormous extent, such as Urmitz (see Petrasch, this volume). Unfortunately, they were excavated before World War II and are extremely badly documented. During the Michelsberg culture the first sub-surface flint mines, for instance at Rijckholt in the Maas valley, are maintained. Salt may also have been extracted and traded over considerable distances (Weller 2002).

EASTERN EUROPE

Early Pottery

The study of ceramic wares constitutes an important resource in studies of the Neolithic. Until recently it was generally accepted that the appearance of pottery in most European countries broadly coincided with the spread of farming (Gibson and Woods 1997). However, numerous fragments of pottery have been recovered from Palaeolithic sites in southern China, directly radiocarbon dated to 16,000–15,000 BP (Zhao and Wu 2000; Pearson 2005; Budja 2007). Pottery from a group of sites in the middle stretches of the Amur river in the Russian Far East shows radiocarbon ages of 13,300–12,300 BP (Kuzmin and Orlova 2000). The pottery at Ust'-Karenga, north of lake Baikal, has been radiocarbon dated to 12,000–11,000 kyr BP (Kuzmin and Vetrov 2007; Kuzmin 2007). Significantly, all these sites are found in the context of exclusively hunting-gathering economies with no evidence of either farming or stock-breeding.

Similarly, many radiocarbon dates have recently become available for hunting-gathering communities with early pottery in the Russian steppe zone. Pottery appears in the north Caspian area, the middle-lower Volga (Yelshan, c. 7200 BC) and the lower Don (Rakushechnyi Yar; c. 6800 BC). Stable settlement is indicated by sites in the middle-lower Volga (Yelshan) at 6800 BC, and in the Caspian lowland and on the lower Don at c. 6000 BC. The age of Dniepr-Donets and Bug-Dniestr sites lies between 6200 and 5000 BC. Hence, in the majority of cases these sites are either earlier or contemporaneous with the early farming sites of south-eastern or central Europe, suggesting that the origin of ceramics in eastern Europe was independent from the Near East. However, the early appearance of ceramics at the western margins of the central Asian steppe zone and the high degree of perfection make its local invention unlikely. Vybornov (2008) seeks its

sources in the trans-Caspian deserts. Significantly, a network of culturally related pottery-bearing foraging sites arose along the waterways further north (Vinogradov 1981). Ultimately, this pottery horizon might have its origins in the early pottery of Siberia and China (Gronenborn 2009b). Future research should be geared towards closing this link.

This pottery horizon then spreads from the Russian steppe zone into the forest zone northwards up to the Baltic coast and from there westward until its final outliers are reached with the Ertebølle and Swifterbant traditions (Timofeev 1998; Hartz et al. 2007; Gronenborn 2009b; Gronenborn 2014).

The Yelshan and Rakushechnyi Yar

Based primarily on pottery styles, several local cultures are identified in the south-east European plain. Yelshan has been identified in the middle Volga basin, near Samara. Yelshan pottery was manufactured from the local sandy clay, with naturally occurring organic matter and small mollusc shell fragments. Vessels had round or pointed bottoms and straight rims with flat, round, or pointed edges, later developing into S-profiled rims. The majority of vessels were undecorated, but incised lines, pit impressions, or short notches forming zigzag patterns occasionally occur. Several vessels were decorated by a belt of pits and ‘pearl’ impressions beneath the rim (Vybornov 2008).

The majority of pottery vessels from Rakushechnyi Yar sites on the lower Don bear no ornament. Decorated vessels constitute 10–11% in the lowermost level, but reach up to 47% in the upper Neolithic ones. Decoration was usually restricted to the upper part of the vessel and consisted of the impressions of stamps, including fish bones and shell rims. The simplest ornamental patterns were found in the lowermost levels and usually consist of incised lines and isolated triangular, oval, and rhomboid impressions forming parallel rows beneath the rim. In upper Neolithic levels, the patterns include zigzag lines formed by comb impressions. Still later appear herringbone patterns formed by incised lines (Fig. 10.3).

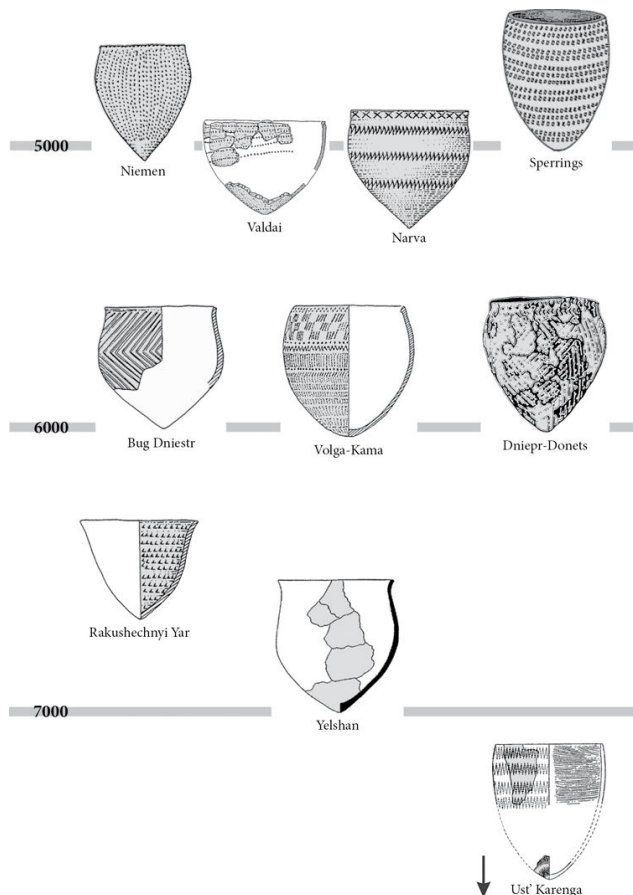


FIG. 10.3. Neolithic cultures in eastern Europe and Siberia (the ceramic vessels are not to scale; after [Preuss 1996](#); [Dolukhanov and Timofeev 1993](#)).

The early pottery-bearing sites in the Russian European plain were nearly exclusively seasonal settlements, often with recognizable post-framed domestic structures. They were located either on river floodplains or in the immediate vicinity of ephemeral lakes (as on the north Caspian lowland).

The existing evidence suggests that the bulk of the meat diet was obtained by hunting wild ungulates (saiga antelope, aurochs, red deer, roe deer, onager) and water fowl. The lower Don sites also include numerous fish remains: pikeperch (most frequent), sheatfish, carp, roach, sturgeon, and pike, alongside concentrations of edible molluscs, mostly the gastropod snail *Viviparus dilluvianus* Kunth and the mussel *Unio pictorum* Linn.

Several pot sherds from Bug-Dniestr culture sites (Baz'kov Ostrov, Sokol'tsy, Mit'kov Ostrov, Savran', Ladyzhin, Zan'kovtsy, Mikulina Broyaka, Shumilovo) have revealed imprints of cultivated plants: emmer wheat (*Triticum dicoccum*), hulled barley (*Hordeum vulgare*),

millet (*Panicum miliaceum*), and two supposed linen seeds (*Linum usitatissimum*). An easily identifiable imprint of an emmer spikelet was found on a pot sherd from Zan'kovtsy (Kotova 2003; Pashkevich and Gerasimenko 2009). There is little doubt that the subsistence of the Dniepr-Donets groups was essentially based on hunting and food collecting, with special importance for freshwater fishing. There is evidence for stock breeding, particularly in the southern areas. Domesticated species prevail among the animal remains of the Buz'ki site, where cattle dominate (28%), followed by sheep/goat (2%) and pig (2.5%). Some impressions of cultivated cereals on pottery have also been identified as belonging to hulled wheats (einkorn and emmer), hulled barley, oat, bitter vetch, and possibly peas (Kotova 2003).

Based on the occurrence of 'hoe-like' bone implements and cereal impressions on pottery, several writers (Danilenko 1969; Markevich 1974; Kotova 2003) view these sites as reflecting a transitional stage between forager-type and farming economies. An alternative view (Dolukhanov 1978) considers them as belonging to groups of foragers involved in intensive contacts with neighbouring farming communities.

The Russian Forest belt, the Baltic coast and beyond

'Early Neolithic' cultures on the Pontic lowland and forest-steppe of the east European plain (Sursk, Dniepr-Donets, Bug-Dniestr, and others) feature developed pottery-making. In their earlier stage, they shared common elements, such as conic and flat-bottom vessels ornamented by strokes and incised lines (Kotova 2003). Conic pointed-bottom wares are also characteristic for the pottery traditions of the Russian forest zones and Baltic coast such as Upper Volga or Narva, and equally of Sperrings or the Early Northern Comb Ware (ENCW) of Karelia and the Kola peninsula (Piezonka 2008; Skandfer 2009). This typical shape is also evident further west in Ertebølle and Swifterbant (Hartz et al. 2007).

THE 'NEOLITHIZATION' OF WESTERN EURASIA

For many decades the discussion around the Neolithization of western Eurasia has circled around the question of to what degree population movements would have contributed to the spread of farming and animal husbandry (e.g. Richards 2003; Renfrew 2003; Zvelebil 2000; Whittle 2007). Those who acknowledged population movements discussed possible exchange and interaction processes between the

immigrant groups and the local Mesolithic hunter-gatherers (Gronenborn 2007; Zvelebil and Lillie 2000). With the new archaeogenetic analyses on skeletal material, the discussion can now move to a firmer basis. On the basis of mitochondrial DNA (mtDNA), inherited along the female line, Haak et al. (2010) were recently able to show that the early Neolithic central European LBK population is related to the present-day population in Anatolia and was possibly quite distinct from the European Palaeolithic and Mesolithic populations. Based on analyses of the Y-chromosomal male side, Balaresque et al. (2010) argue that the haplogroup R1b1b2—predominant in modern European males—would have spread from a source region in Anatolia. Its appearance in Europe may be linked with the spread of farming.

The genetic evidence therefore supports those hypotheses which have been in favour of considerable migration by humans of an ultimately Near Eastern origin in connection with the introduction of farming and animal husbandry to Europe. However, when this immigrant population began to arrive in Europe is still unclear. A few late Mesolithic samples, such as those from Hohlestein and Dürrenberg in Germany, share the mtDNA haplotype U, which is predominant in the Palaeolithic and Mesolithic population of central and northern Europe (Bramanti et al. 2009), but this haplotype is virtually absent from the LBK sample (Haak et al. 2010). However, at least for western central Europe there is considerable archaeological evidence of interaction between the LBK and hunter-gatherers or hunter-gatherer-pastoralists of the La Hogue tradition (Gronenborn 2007). So possibly, archaeological entities such as the late and terminal Mesolithic and La Hogue may actually already have been constituted largely by newcomers and may have arrived in Europe as early as the seventh millennium (Gronenborn 2014). They would not show up genetically in LBK samples, even if culturally they were hunter-gatherers. The situation towards the north is different: indications of personal exchange and cohabitation are limited and populations seem to have mixed to a greater extent only during the fourth millennium BC (Bramanti et al. 2009; Lübke et al. 2007).

The next question, then, is why people moved. One answer may lie in recently recognized Holocene cooling events of which the so-called '8200 ky BP event' (6400–6000 BC) was the most prominent (Weninger 2006). These cooling events might have determined the spread rate of the Neolithic expansion through externally triggered crises (Gronenborn 2007, 2009a). Following this hypothesis, the spread of agriculture until the mid-Holocene occurred in the context of unstable climatic conditions with repeated cold spells and dry episodes. The Neolithization of central Europe may then be seen as a

long-term step-wise transition following streams which had their points of origin far outside Europe itself (Guilaine 2001; Gronenborn 2009b; Bocquet-Appel et al. 2009; Schier 2009) (Fig. 10.1c). Uncertain—at this point—are the origins and mechanisms of the spread of pottery within eastern European hunter-gatherer societies. However, for this region climatic fluctuations are also being discussed as triggering forces for phases of innovation (Kotova 2009).

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CHAPTER 11

THE ATLANTIC MESOLITHIC–NEOLITHIC TRANSITION

NICK THORPE

INTRODUCTION

THE general background to the question of the nature of the Mesolithic–Neolithic transition is of course the broader question of ‘the domestication of Europe’ (Hodder 1990; Thorpe 1996), involving not just the spread of agriculture across Europe, but also new ways of thinking and, in some areas at least, the widespread appearance of monuments for the first time. This general debate has swung between poles of migration and diffusion, but with the majority opinion currently being that different processes were dominant in different parts of Europe, in particular that north-west Europe saw a greater degree of continuity than central Europe or the Mediterranean. This clearly relates to the existence of different rates of expansion of the Neolithic across Europe (Bocquet-Appel et al. 2012).

The chronology and thus identity of the earliest Neolithic is also significantly different from southern Scandinavia down to Iberia, with the Neolithic beginning c. 3900 BC in the former, appearing together with TRB (*trichterbecher*, or Funnel Beaker) pottery originating in northern Germany (see Müller and Peterson, this volume), and c. 5500 BC in the latter, appearing together with Cardial Ware originating in Italy or southern France (see Malone, this volume; Guilaine, this volume). This has led to some fragmentation of research; thus a significant recent volume on the Mesolithic–Neolithic transition deals only with north-west Europe (Glørstad and Prescott 2009).

The majority of the discussion turns on traditional archaeological forms of evidence; however, one new scientific technique that has the potential to provide new information on the question of what degree of immigration (if any) accompanied the spread of the Neolithic is DNA analysis. This has primarily involved the consideration of human DNA (Pinhasi et al. 2012), but some work has also been carried out on domestic animals (Burger and Thomas 2011). Much of the work has

naturally been undertaken on modern samples, for ease of access and absence of contamination concerns, but the difficulty is to relate the patterns observed to any particular period in the past. Ancient DNA is thus more immediately relevant, but small sample size coupled with overenthusiastic interpretation has resulted in useful but scattered observations thus far. For instance, [Skoglund et al. \(2012\)](#) argued that just a single late TRB sample from mainland Sweden compared with three later Neolithic Pitted Ware culture samples from Gotland provided significant evidence concerning the neolithization of Sweden.

SOUTHERN SCANDINAVIA

In southern Scandinavia the area of interest includes Denmark and southern Sweden (mainly the province of Skåne [Scania]) and Oslo fjord in Norway: broadly speaking, the region occupied by the Ertebølle culture. This has long been a transition of wide interest (see papers collected in [Fischer and Kristiansen 2002](#)), in part due to the wide range of Mesolithic evidence available, in particular from the remarkable survival of underwater settlement sites (e.g. Tybrind Vig [[Andersen 1987](#)]).

The late Mesolithic Ertebølle culture has often been discussed in terms of complex gatherer-hunters, with its evidence for possible sedentism at shell midden sites, artwork, burials and possible cemeteries, and violent conflict ([Thorpe 2003](#)). Shell midden sites do not occur on all Scandinavian coasts as a result of the different environmental conditions for shell growth within the Baltic Sea, but where they are found they have been subject to a long history of investigation. This suggests that they were probably semi-permanent or permanent settlement locations, although there are very few traces of houses at these sites. Exploitation of resources, especially marine ones, seems to be quite intensive—with expansion into deeper waters, for example—and has been allied with the evidence of tree clearance to suggest a well-developed economy. All this goes to build up a general picture of an economy in which communities were widely engaged in surplus production, some of which, such as trapping animals for their furs and birds for their feathers, may be for external exchange. It is also worth noting that shell middens would steadily build up, becoming more visible from both land and, perhaps more importantly, sea. They would thus become artificial constructions altering the landscape, as they became landmarks for any voyager. In this sense they can be said to have become monuments ([Thorpe 1996](#)) and therefore it could be argued that monuments were not an entirely

Neolithic phenomenon.

The burial record for the later Mesolithic of southern Scandinavia is remarkably varied and rich (Thorpe 1996), probably the most significant in Mesolithic Europe (Grünberg 2000). There is great variety in burial practice—both inhumation and cremation were practised, with cremation varying from complete to partial. Some individuals received burial at sea; others were interred in covered graves. Many had ochre scattered on them or their clothes. The human contents of the graves also show a wide range of variation. Although most graves contain single burials, there are double inhumations, mass inhumations, and mass cremations. The grave goods also demonstrate considerable variety, both in number and type. As Nielsen and Brinch Petersen (1993) suggested, there are three main burial groups with respect to grave goods: those without any (at least half the total individuals buried), those with some, and those with large numbers of items. There is also a wide range of objects buried, from parts of animals through to stone axes. The original interpretation was that concentrations of late Mesolithic burials were true cemeteries, in the sense of being communal burial grounds set aside from the settlement area. However, the vast majority of these groups of burials are closely associated with settlements (Nielsen and Brinch Petersen 1993; Thorpe 1996), whilst those where no nearby settlement has been identified are or may have been near to shell middens or other sites of occupation that left little trace. If so, the presence of burials could be seen as one manifestation of the significance that these major coastal sites had acquired.

The Mesolithic of southern Scandinavia also provides clear evidence for contacts with farmers to the south. This can be seen most clearly in the importation of copper objects originating in the Balkans and of stone axes, the most well known being the shoe-last axes from the LBK and jadeite axes from the Alps (Klassen 2004). Pottery is also found, in the form of pointed-base vessels and ‘blubber lamps’, although its origin is not so clear.

This reminds us that presence of the LBK, with its fully agricultural economy, on the North European plain from c. 5400 BC means that for the Mesolithic inhabitants of southern Scandinavia this was definitely what Zvelebil and Rowley-Conwy (1986) would term an ‘availability phase’ when Neolithic ways of life could potentially have been adopted. Although there is a range of evidence for contacts between the LBK and the Ertebølle culture in Denmark and Sweden, there are virtually no cases of small-scale experimentation with agriculture before 4000 BC, as one might expect in a gradual transformation. Indeed, the radiocarbon and stratigraphic evidence conclusively demonstrates the swift adoption in southern Scandinavia

of a Neolithic economy with (some exploitation of) domesticated species and monumental burial under mounds around 3900 BC (Persson 1999, Chapter 4). This process seems to take about a century and shows no clear trend from east to west or north to south. Although this has sometimes been argued to favour immigration theories (e.g. Skak-Nielsen 2004), any explanation of change being imposed from the outside has to deal with the question of why there was a vast chronological gap between the appearance of the Neolithic at c. 5400 BC within a few days travel of Scandinavian Mesolithic groups and the eventual adoption of Neolithic practices and products.

Rowley-Conwy's (1984; updated 2011) theory of a severe resource shortage has proved popular. He argued that the post-glacial rise in sea level created a rich marine habitat; communities became sedentary, thus requiring local resources year-round; although resources were plentiful overall, there was a shortfall in food in late winter and early spring; this gap was filled by gathering shellfish; after 4000 BC falling relative sea levels in western Denmark triggered a decline in oysters, producing a food supply crisis, and finally; the only alternative was to take up the domesticated plants and animals familiar from contacts with agricultural communities to the south. Objections to Rowley-Conwy's explanation have been on a number of grounds (summarized in Thorpe 1996, 90–91). First, it is difficult to see why a shortfall in the oyster supply could not have been replaced by increased fishing, perhaps with storage of fish, rather than necessitating a complete social and economic transformation. Second, the oysters were limited to Atlantic coasts, so the impact on inland areas and the Baltic coast is unclear (Milner and Laurie 2009). Although Rowley-Conwy specifically considered western Denmark, the common background, common speed of transition, and common outcome for the whole of the area suggest that any explanation needs to encompass the entire region.

Stable isotope evidence from human bones of both Mesolithic and Neolithic date has been used to argue that there was a dramatic change in diet away from marine resources and towards domesticates at the Mesolithic–Neolithic transition, and thus significant discontinuity (Schulting 1999a). Although the results do seem clear-cut they do not fit with the archaeological evidence of continued use of marine resources in the diet, most obviously the presence of lipids from processing marine and freshwater foods in Neolithic pottery (Craig et al. 2011). At the site level there are discontinuities of practice, but the overall pattern is certainly one of continuity. Also, as Andersen (2008) notes, there is a significant degree of continuity at coastal (mostly shell midden) sites from the Mesolithic to Neolithic and relatively little sign of the new domesticates: whilst the earliest

domesticated animal remains have been claimed in some such contexts (Sørensen 2009) questions have been raised concerning the accuracy of identification (Rowley-Conwy 2011). A continuation of hunting is shown by the reuse of many Mesolithic sites primarily for hunting and the distribution of offerings in wet places. Many major deposits were built up in locations overlooked by prominent hills (probably long-standing significant points in the landscape) near to Neolithic hunting, rather than farming, sites. The general verdict on early Neolithic agriculture in most of southern Scandinavia is that it was real, and that changes in the subsistence regime did take place, but that the shift to a fully food-producing economy did not happen until the end of the early Neolithic. However, Oslo fjord in Norway is an exception, as it is agreed that economic changes here were minimal (Glørstad 2009; Solheim 2012), and followed by a reversion to gathering–hunting with the Pitted Ware communities of the late fourth millennium.

One new development in the Neolithic has traditionally been seen as the appearance of monuments in the form of earthen long barrows. There are approximately 40 probable long barrows reported from Denmark, mostly in Jutland (Kristensen 1989), and a few from Scania, concentrated in the Malmö area on the west coast (L. Larsson 2002). Although long barrows are more widely known in northern Europe, possible influences from shell midden burials may nonetheless be significant given the placing of the dead in long shell middens. Unlike Britain, where causewayed enclosures were once thought to have been constructed early in the Neolithic and thus to have formed a significant part of how becoming Neolithic was worked through in practice, in southern Scandinavia they have always been recognized since their discovery as a phenomenon of the middle Neolithic. They appear only around 3400 BC, several centuries after the beginning of the Neolithic (Thorpe 2001) and centuries later than in Britain, and may point to significant social change in southern Scandinavia at this point.

Together, these observations suggest that processes of both gradual transformation and dramatic change operated during the Mesolithic and early Neolithic in southern Scandinavia, but in different areas of social life. Overall, however, there is clear evidence for continuity, which is the primary reason why those archaeologists who favour a migration model for the origin of agriculture here are in a distinct minority.

Instead, most recent interpretations may be situated within a model which stresses internal social competition (Thorpe 1996; Tilley 1996; Fischer 2002). During a lengthy period of social competition—which the material culture, settlement and economic evidence, burials, and

traces of violent conflict during the Ertebølle period all suggest—there were many occasions on which domesticates could have been introduced, but social rules kept them at bay. However, a long period of social competition would itself undermine traditional structures of power and authority. As clearings were established in the forests to encourage animals or plant growth this dealt a blow to existing notions concerning the proper relationship between the community and the landscape and also increased notions of territoriality which were already developing through economic specialization, the permanence of settlements, and the development on the coast of cumulative monumental constructions in the form of shell middens. A conceptual shift may have taken place in the relationship between human action and the environment. The degree of intervention required by agriculture and the construction of Neolithic communal monuments would not then have seemed so alien. If marriage exchanges existed with Neolithic communities to the south (perhaps cementing the exchanges of goods noted above), then incoming marriage partners would have brought with them knowledge of agricultural practices.

THE LOW COUNTRIES

In Holland and Belgium the situation is rather different, with Linearbandkeramik (LBK) farming communities appearing on loess soils in the Scheldt basin in Belgium and Limburg in the Netherlands c. 5300 BC. This is generally argued to be an influx of farmers due to the lack of continuity in lithic production (e.g. [Louwe Kooijmans 2007](#)). The border region thus created has been proposed by [Keeley \(1992\)](#) to be characterized by warfare, with farmers protected by frontier forts, but the evidence from the sites themselves, such as Darion with its incomplete ditch and palisade circuit and the general lack of evidence of conflict in the surrounding region argues strongly against this. Moreover, there is a considerable body of material, in the form of arrowheads, axes, pottery and domesticates, pointing to exchanges between farmers and gatherer-hunters ([Vanmortfort 2008](#)).

As in northern Germany, this initial expansion of a farming economy was then followed by a long hiatus, in this case of nearly two millennia, during the Michelsburg period. In both Belgium and the Netherlands the wetlands and sandy lowlands saw the emergence of pottery use in later phases of the Swifterbant culture ([Raemaekers and De Roever 2010](#)). From about 4600 BC the subsistence economy was a roughly equal mix of wild and domesticated resources, some of the latter perhaps being imported. Although this may appear a

temporary situation on the way to a full agricultural economy, this mixed economy lasted for a further 1,000 years. The difficulties this poses for traditional terminology are indicated by the description of the Swifterbant culture as both Mesolithic and Neolithic by various authors.

Swifterbant burial practice is well established ([Raemaekers et al. 2007](#)), with small cemeteries on sand dunes next to settlements with single and multiple burials of adults and children, with relatively small numbers of grave goods. There are also single bones in the settlements and nearby streams, which do not seem to come from disturbed graves, but represent a different type of treatment of some of the dead.

In the southern part of the Swifterbant area the Hazendonk group develops after 3700 BC, which has been interpreted as a hybrid Mesolithic–Neolithic culture. The Hazendonk group saw the development of a new pottery style, new lithic styles, and changes in the details of burial practice all of which suggest Michelsburg influence. In economic terms, however, they continued the mixed economy of the earlier period, rather than adopting an entirely agricultural economy.

Given the long, drawn-out nature of the transition, the majority opinion is that there was a significant degree of continuity from the Mesolithic to the Neolithic (e.g. [Crombé and Vanmontfort 2007](#)), with a piecemeal adoption of the Neolithic (e.g. [Louwe Kooijmans 2007](#)). The length of time taken is attributed to a perceived lack of attractiveness of the Neolithic economy, which must have been quite familiar, given the clear evidence of exchange across the frontier of lithics, pottery, and domesticates.

ATLANTIC FRANCE

The knowledge base for Brittany and Normandy is rather different again, with excavated settlements for both the Mesolithic and Neolithic being relatively rare, but burials and monuments far better known and thus the focus of debate. The famous shell midden sites of Tévéc and Hoëdic are on small islands off the southern Breton coast, with animal bone remains which may be debris from feasting, which were probably permanently occupied. There may have been other sites on the coast, but sea-level rise has drowned these. The perception of a dependence on coastal resources has led to the suggestion that rising sea levels could have caused a crisis ([Dupont et al. 2009](#)). However, numerous other Mesolithic sites inland are known through fieldwalking ([Marchand 2007](#)), but not yet excavated. Recent

excavations at Pen Haut Salaün (Nicolas et al. 2013) point to the reuse of some inland Mesolithic sites in the Neolithic, even if the evidence cannot yet demonstrate continuity of occupation.

There is great debate over the origin of megaliths and burial in stone chambered tombs, which emerge during the fifth millennium BC (Scarre 2007). The oldest theory of the origin of megaliths was that they represented the spread of a religious cult by megalithic missionaries. This was, however, ruled out by the impact of radiocarbon dating, which showed the Atlantic megaliths to be much older than their supposed Mediterranean forebears. This rejection of a Mediterranean inspiration for megaliths led to suggestions of a local origin, pointing to the presence of burials in late Mesolithic Brittany. At Tévéc and Hoëdic these occur in shell middens: 23 burials at Tévéc and 14 at Hoëdic. Men, women, and children were interred together in stone-lined pits, in the most elaborate examples covered by small heaps of stone (cairns) and in one case marked by a small upright stone. The burials date to the period 5500–5000 BC (Schulting 1999b). Ideas of multiple burial therefore already existed among gatherer-hunters of Brittany before the emergence of monuments, and with them the possibility of a purely local development of megaliths, which would require much better chronological control than currently available to assess properly.

Megalithic burial monuments placed the living community's ancestors visibly in the landscape, with the result that they became an important part of future social developments. Making the ancestors visible in this way could also be used by the living as a way of demonstrating their rights to the territory they controlled, perhaps fishing rights in the case of hunter-gatherers on the coast of Brittany, and presumably land and its wealth in the case of Neolithic groups. Earlier models suggested that megalithic tombs acted as territorial markers for societies under pressure because of the lack of land to the west to absorb a growing population. However, two types of evidence fail to support this. The small amount of pollen analysis undertaken suggests that the impact of early farming was relatively slight (Scarre 2001), with clearances mostly at the sites of tombs themselves. Similarly, despite the impact of recent rescue excavation, there are still only a fairly small number of early Neolithic settlements by comparison with megaliths (see Nicolas et al. 2013 for an up-to-date map). It may be that other resources such as the stone sources suitable for making axes and the ornaments found in megalithic tombs were just as desirable as farming land.

A number of passage graves contain reused standing stones (menhirs) with a different set of carvings to those found in the tombs themselves (Cassen 2000). At Gavrinis, one of the most elaborate

tombs, the uncovering of the top side of the chamber capstone revealed that it was part of a substantial carved stone, which joined with the capstones from two other mounds. The carvings on this 14m high stone, and on another possible original stone, have been the subject of two contrasting interpretations: they may be domesticated cattle, sheep/goat, 'axe-ploughs', and axes; or they may be ungulates or ruminants (wild or domesticated), sperm whales, and axes (e.g. [Whittle 2000](#)). These motifs may either be representative of food production through the stages of clearance, cultivation, and pasturing, perhaps in a celebration of the introduction of agriculture; or they may express connections with socially important wild animals, and their inclusion in later monuments at the outset of Neolithic megalithic architecture may commemorate or conceal these connections. The uncertainty of the dating evidence for menhirs means that it is quite possible that some of the monuments date to the late Mesolithic, perhaps at the very end of the period, and potentially relate to some evidence for the presence of domesticated animals and crops within the Mesolithic.

One exceptional find was that of two complete cattle skeletons in a pit below the long mound of Er Grah ([Tresset and Vigne 2007](#)). Radiocarbon dating showed that the cattle were placed there in the late sixth millennium BC, that is in the late Mesolithic. The origin of the cattle must be Neolithic communities to the south and they can therefore be interpreted as exotic imports. A similar process could lie behind the finds of early cereals in the drowned peat bog off the Locmariaquer peninsula ([Visset et al. 1996](#)), although the dating evidence here is not entirely secure.

The general lack of evidence other than burials and monuments has made the nature of the Mesolithic–Neolithic transition difficult to assess. Current opinion favours an origin for megaliths ultimately in Iberia, where radiocarbon dates mirror those for early tombs in France, but this is believed to be a matter of diffusion of inspiration up the Atlantic coast, perhaps related to the spread of lithic technology ([Marchand 2005](#)), rather than immigration.

BRITAIN AND IRELAND

The traditional view was that agriculture, like all other changes, was introduced to Britain and Ireland from the continent. However, this interpretation of migration as prime mover was undermined by the observation that no single region of continental Europe appears to have possessed the range of material culture and site types found in the British Isles. Recent revivals of this interpretation ([Sheridan 2007](#))

still grapple with this difficulty, although this does not of course mean that there was no immigration. The apparent speed of the transition from the Mesolithic to Neolithic can be interpreted either as a point in favour of colonization (e.g. [Rowley-Conwy 2004](#)) or against it (e.g. [Bradley 2007](#), 36).

Some recent thinking highlights substantial continuity in both population and life-way (summarized in [Thorpe 2009](#)). Specifically, the beginning of the Neolithic was perhaps not very Neolithic; a shifting population living in mobile camps did not invest significantly in agriculture, either in terms of crops or animals. According to this argument, Mesolithic people adopted selected material symbols (e.g. axes and the earliest monuments known locally) and ideas of the Neolithic without fully embracing an agricultural lifestyle, that is remaining Mesolithic in economic terms. New crops and animals were used primarily in particular and limited contexts, relating to feasting and other ritual activities (e.g. [Thomas 2004](#)). However, the application of soil sampling has led to the discovery of a significant volume of cereal remains on British Neolithic sites ([Jones and Rowley-Conwy 2007](#)). There is a consistent pattern of low levels of cereal grains and chaff items, comparable with LBK settlements ([Bogaard and Jones 2007](#)). This may relate to the appearance of flint mines at the beginning of the Neolithic in Britain, if the axes mainly produced were used for tree clearance. Stable carbon isotopes have been examined for indications of a marine or terrestrial diet ([Schulting and Richards 2002](#)), leading to the conclusion that there was a sudden dietary shift with the onset of the Neolithic in Britain, which has in turn been taken as evidence against a gradual uptake of domesticated plants and animals into Mesolithic society. The case is clearest for Scotland, where both Mesolithic and Neolithic human remains are available in some numbers, though this appears to conflict with the evidence for the apparent continuity of use into the Neolithic of midden sites and shellfish collecting ([Milner et al. 2004](#)).

The emergence of new mortuary practices in the early Neolithic (see [Fowler and Scarre](#), this volume) is also hard to relate to the Mesolithic evidence in an unequivocal way. Cave burial was dominant in the early Mesolithic ([Conneller 2006](#)), but a gap in radiocarbon dated cave burials between c. 5000 and c. 4000 BC has been visible for some time. The only certain later Mesolithic human remains in Britain come from shell middens on Oronsay off the west coast of Scotland ([Meiklejohn et al. 2005](#)). In general there is a clear lack of evidence for the kind of social complexity agreed to exist within southern Scandinavia. The general assumption has tended to be that monumental burial, in the form of long barrows and stone chambered tombs, was introduced at the very beginning of the Neolithic. Early

radiocarbon dates for such sites therefore implied an earlier beginning to the Neolithic as a whole (e.g. [Schulting 2000](#)). However, a recent programme of mass sampling from both long barrows and chambered tombs in southern England gives a start date during the fourth millennium BC, c. 3750 BC, rather than at its beginning ([Whittle et al. 2007](#)). Whilst it is possible that some smaller chambered tombs in western Britain, such as portal dolmens, may begin earlier ([Sheridan 2004](#)), there is no substantial evidence supporting this. The dates for causewayed enclosures are rather similar, probably beginning around 3700 BC ([Whittle et al. 2011](#)). These monuments therefore play no role in the Mesolithic–Neolithic transition in Britain—as in Scandinavia they may mark a significant social change during the Neolithic.

There may be an earlier beginning to causewayed enclosures in Ireland, perhaps around 4000 BC at Magheraboy in County Sligo ([Danaher 2007](#)). Indeed, it is clear that there are some significant differences between Ireland and Britain. These have traditionally been seen in terms of Irish deficiencies, such as the ‘loss’ of microliths, but there are significant features of the Irish Mesolithic which do not occur in Britain, such as the production of ground stone axes. The most striking difference is that there are radiocarbon dates before 4000 BC for cattle (and possibly also sheep) in Ireland from Ferriter’s Cove, County Kerry (two dates with an average of c. 4300 BC: [Woodman and McCarthy 2003](#); cf. [Rowley-Conwy and Legge](#), this volume; [Tresset](#), this volume). There is no evidence for aurochs in Ireland, thus the cattle must be domestic. Taken together, this evidence may suggest an earlier inception to the Neolithic in Ireland than in Britain ([Cooney 2007](#)).

This reminds us of the crucial importance of regional variation, and the need to consider multiple trajectories of change. Concerning houses, domesticated animals, and crops, there is a persuasive case for a greater degree of early Neolithic sedentism than recognized in the models currently dominant. However, in itself this does not mean that we need to return to the hypothesis of massive immigration. Instead a combination of limited population movement and indigenous change seems most plausible at present (e.g. [Whittle 2007](#)).

ATLANTIC IBERIA

In western Iberia (Spain and Portugal) the transition to the Neolithic occurred c. 5500 BC. The background to the transition is quite different to areas further north due to the impact of the Cardial culture, originating possibly in Italy or southern France, in eastern

Spain from c. 5500 BC (Guilaine and Manen 2007). The lack of Mesolithic evidence locally, particularly for long-distance contacts and social complexity, has recently been combined with ancient DNA from Catalonia to support an interpretation of migrating farmers (Gamba et al. 2011). Cardial ware reached parts of north-west Spain and northern Portugal only shortly later (Arias 2007), implying a rapid shift to the Neolithic.

The late Mesolithic of the Atlantic coast is known almost entirely from the large shell midden sites of the Tagus estuary, especially those of Muge (van der Schriek et al. 2007). These persisted until c. 5000 BC, and thus overlap with the inland early Neolithic by some five centuries (Carvalho 2010). As with shell middens elsewhere along the Atlantic these were major sites, perhaps monumental in scale, with a strong burial record. Central Portugal saw a movement of the Neolithic frontier around 5200 BC, but in Cantabria and northern Portugal, neolithization occurred only after 5000 BC. The abandonment of coastal sites has been related either to resource depletion or to environmental changes (Dean et al. 2011).

In Iberia, megalithic tombs are constructed from c. 5400 BC. There is a possibility that, just as in Brittany, megalithic constructions began with menhirs, some carved with a shepherd's crook (Calado 2002), but this speculation needs to be supported by dating evidence.

The patchy and piecemeal nature of the early Neolithic and the lengthy transition in those areas lacking a Neolithic presence leads to the current interpretation of a mixture of colonization and local adoption (e.g. Arias 2007; Ruiz 2005).

CONCLUSION

The overall picture is that recent archaeological research and opinion broadly favours a strongly indigenous Mesolithic–Neolithic transition, but in many areas along the Atlantic population movement was also involved in neolithization. In addition, it is clear that there is much variation in the nature and speed of the transition even within regions, and thus the consensus is that a mixture of local, regional, and western European processes was at work in creating the observed patchwork.

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PART III

**NEOLITHIC WORLDS AND NEOLITHIC
LIFEWAYS**

Houses, Habitation, and Community

CHAPTER 12

SETTLEMENTS IN SOUTH-EAST EUROPE

PÁL RACZKY

INTRODUCTION: TELL AND NON-TELL SETTLEMENTS

NEOLITHIC open-air settlements in south-east Europe fall into two groups. One consists of a single, usually horizontal layer, the other comprises superimposed remains from several habitation layers. Whilst horizontal settlements occur throughout Europe, the distribution of ‘settlement mounds’ rising above the natural surface of the landscape is limited to the Near East, the Balkans, and the south-eastern part of the Carpathian Basin (Childe 1950, 38–39; Wace and Thompson 1912; Gimbutas 1974, 19–25, 29–33; Kalicz and Raczky 1987, 14–19; Chapman 1989, 1997a, 158–162; Raczky 1995; Whittle 1996, chapters 3–5; Bailey 2000, 156–177; Steadman 2000; Gogâltan 2003; Link 2006, 7–14; Rosenstock 2005, 2006, 2009, Raczky and Anders 2008, 35–37; Anders et al. 2010).

The northernmost Neolithic settlement mound is the tell of Polgár-Csőszhalom (Hungary), located by the northern reaches of the Tisza river, very close to the famous obsidian sources near Tokaj (see references in Raczky and Anders 2008). Artificial settlement mounds in Europe are between 2.5 and 10m high, their counterparts in south-west Asia 5–50m. Tells may be of conical or flattish shape, with horizontal extents varying between 0.1 to 10ha, but reaching up to 20ha in the Near East (Chapman 1989, 36–38, fig. 2; Rosenstock 2005, 222–224, fig. 1a–b; Menze et al. 2006, 322, 325, fig. 10–11).

Depending on local languages, these often attractive landscape features are called ‘tell’, ‘höyük’, ‘tepe’, ‘magoula’, ‘tumba’, ‘mogila’, ‘măgura’, ‘település-halom-lakódomb’, or ‘Siedlungshügel–Wohnhügel’ (Chapman 1997a; Rosenstock 2005, 2006). The term ‘tell’ (mound) was first used in a European context by Ferenc Tompa (1937, 47) for settlements of the Tisza culture on the Great Hungarian Plain and has since become generally accepted in the archaeological literature (Gogâltan 2003, 222–223). In south-east Europe, tell-like settlements may be at least 1 to 2.5m thick, and possess at least two superposed

habitation layers. Single-layer, horizontal settlements are usually characterized by a deposit only 25–50cm thick, although some have fills up to 1m thick (Kalicz and Raczky 1987, 14–16; Link 2006, 10–14; Gogăltan 2003, 223–224).

Depending on local research traditions, different forms of phasing and terminology (Neolithic, Eneolithic, etc.) are used for the first tell-building cultures in south-east Europe. In absolute terms, the beginnings of tell sites date to around 6700/6500 BC, and their end to approximately 4000/3700 BC. Tells thus existed over c. 2500–3000 years during a period when food-producing economies emerged over a wide area between Greece and Hungary.

THE PHYSICAL AND SOCIAL CONDITIONS OF THE FIRST TELLS

Tell settlements mainly consist of stratified debris from clay houses, constructed using various techniques (*pisé*, mud brick, wattle-and-daub, etc.; Aurenche 1981, 42–72; Naumann 1971, 43–51; Stevanović 1997, 341–345; Rosenstock 2005, 228–233; Piesbergen 2007, 20–32). These structures frequently burnt down, but were systematically reconstructed on the same spot. Construction deposits were thus created by intentional levelling, alongside the daily accumulation of refuse. Settlement mounds hence represent long-term, planned activity. In addition to natural erosion, there is also evidence of conscious landscaping through the systematic removal of rubble and the remains of earlier houses. Physically, the resulting tell ‘body’ was created through a complex creative process including broad-based communal effort and resulting in a regionally significant topographic monument. The mound itself may hence be seen as the material manifestation of a community, its coordinated activity and communal life (Evans 2005). The apparently undisturbed 2,500 years of tell development in south-east Europe suggest long-term economic and social stability, which partly inspired Gimbutas’ (1974, 17–19) idea of a collective identity labelled the ‘Civilization of Old Europe’, presuming the evolution of an urban-type system of institutions.

Evidently, the systematic activity of tell creation had a feedback effect on those who built these sites and, over the long run, contributed to the cohesion of communities and their inseparable, complex system of economic, social, sacral, and symbolic norms (Chapman 1997a; Kotsakis 1999; Bailey 1999; Tringham 2000b; Evans 2005; Gheorghiu 2008).

EARLY RESEARCH HISTORY OF TELLS IN EUROPE

Tells in Europe have long fuelled the imagination of modern villagers and treasure hunters, whilst their sequence of superimposed strata offered relative chronologies for artefactual assemblages. Unsurprisingly, the first more-or-less scholarly excavations in Europe also targeted these mounds. One tell of key importance was investigated by [Vasić \(1932–1936\)](#) near Vinča in Serbia between 1908 and 1934. He found periodically renewed adobe houses built on wooden frames, plastered open-air fireplaces, and refuse from Neolithic daily life, down to a depth of 9.5m.

The finds from its superimposed layers made the Vinča tell a yardstick for the Balkan Neolithic and, to some extent, Copper Age cultural development. Its phases have been alternatively labelled Vinča I (Tordos) and Vinča II (Pločnik) or A to D ([Chapman 1981](#); [Schier 1997](#)). Gordon Childe compared this site to the tell of Troy in western Anatolia, and—on the basis of its finds—hypothesized a cultural/chronological connection between the two settlements at the beginning of the third millennium BC ([Childe 1929](#), 34–35; [Renfrew 1976](#), 42–52). This was one of the cornerstones of his historical model of ‘*ex oriente lux*—from the east the light’, whereby ethnic groups originating in the Near East crossed the Aegean and penetrated the Vardar and Morava river valleys before reaching the Danube region ([Childe 1939](#), [1950](#), 36–57). In the German literature, [Fritz Schachermeyr \(1953\)](#) popularized the same idea as ‘*vorderasiatische Kulturtrift*—Near Eastern culture flow’.

During the first half of the twentieth century, researchers linked south-east European mounds to this population movement, which supposedly took place in several waves and resulted in the colonization of Thrace, Macedonia, and the Lower Danube region ([Gaul 1948](#), 49–79; [Childe 1950](#), 41–42, 51–53).

TELLS IN SOUTH-EAST EUROPE AND THEIR LOCAL STRATIGRAPHIC SEQUENCES

Tell research followed the development of different national archaeologies. In Greece, Sesklo has long served as a reference point for studies of settlement structure and relative chronology ([Tsountas 1908](#); [Theocharis 1973](#), 68; [Kotsakis 2006](#)). Excavations during the 1950s revealed stratigraphic sequences at the *magula* of Argissa, Otzaki, Arapi, Agia Sofia, and Pevkakia, which together created a coherent diachronic system for refining regional Neolithic

chronologies (Milojčić 1960). In Bulgaria, chronological phases I through VI at Karanovo have framed the standard chronology for the Neolithic and Copper Age (Georgiev 1961; Vajsová 1966, 5–8; Todorova 1981; Hiller and Nikolov 2000), whilst stratigraphies at Vidra, Gumelnița, Sălcuța, and Hârsova—to name but a few—became the chronological standard in Romania (Berciu 1961, 82–86, 158–166; Comșa 1974, 32–33; Mantu 2000; Gogâltan 2003). Tells, especially those at Hódmezővásárhely-Gorzsa, Öcsöd-Kováshalom, and Berettyóújfalu-Herpály, also helped establish relative chronologies for the Great Hungarian Plain (see references in Tálas and Raczky 1987).

These examples illustrate how tell stratigraphies in south-east Europe became almost exclusive yardsticks for reconstructing Neolithic development. Syntheses and interregional comparisons were attempted using parallel phenomena and the presence of ‘import-export’ artefacts (Treuil 1983, 13–114). Consequently, the south-east European Neolithic was summarized in unified chronological tables presenting a *lato sensu* cultural system in a clearly visualized format (e.g. Ehrich 1992; Parzinger 1993, Beilage 1–5; Todorova 1998, tables 1–3; Bailey 2000, fig. 1.3).

With the radiocarbon revolution, settlements along the interface between the Aegean and the Balkans gained pivotal significance. By the 1970s, the stratigraphic sequence at the Sitagroi tell in east Macedonia had shown that local early Bronze Age type finds similar to material from Troy were deposited in layers above strata of the Vinča-Gumelnița culture in the Balkans (Renfrew 1970, 295–308): this provided evidence that the Vinča-Gumelnița cultural complex was older than that from Troy, lending credibility to previously contested radiocarbon dates which, contradicting Childe’s ideas, had placed the beginning of the Vinča tell 2,300 years before the emergence of urban development at Troy at around 3000 BC. Evidently, the Vinča settlement was not established by emigrants from Troy, who hence did not colonize the Balkans (Renfrew 1976, 101–109).

THE REPRESENTATIVE VALUES OF TELLS AND HORIZONTAL/EXTENDED SETTLEMENTS

Increasingly, then, tells became a primary source of information for settlement history. Indeed, compared with tells, horizontal/extended settlements and cave sites (similarly numerous in the region) were often underrepresented or neglected in large thematic summaries. Tell distributions in certain regions often meant that an entire culture was considered a ‘mound culture’ (cf. the Bulgarian Mound Culture; Gaul 1948, 79–207).

Until the 1990s, this research bias hindered the development of a balanced view of tells and horizontal settlements across south-east Europe. Yet, many tells were connected to adjacent horizontal settlements forming an organic unit with the mound (Bailey 1999, 2000, 174–177). At Sesklo, for instance, Theocharis reconstructed a large (almost 10ha) horizontal settlement around the tell, fortified by a stone wall. He recognized that the tell and its external horizontal settlement probably represented a complex, *acropolis-polis* settlement structure (Theocharis 1973, 68, fig. 178) in which the *acropolis* had a special function relative to the outer settlement, the scene of daily life (Kotsakis 1999, 69; 2006, 209–218). This showed that previous tell-centred settlement histories for south-east Europe had led to the generalization of special phenomena erroneously seen as ‘representative’ on a broad scale (e.g. Todorova 1982).

Following these developments, and fostered by planned excavations, large and small horizontal settlements were observed in association with tells from various Neolithic and Copper Age periods. At Podgoritsa in northern Bulgaria, the association between the tell and external ‘non-tell’ features could be demonstrated as a general south-east European phenomenon (Bailey 1999, 2000, 175, fig. 5.8). Recently, geophysical surveys and large-scale excavations have revealed numerous examples showing this ‘symbiosis’ between tell and horizontal/extended settlements, including Paliambela in Greece (Kontogiorgos 2010), Pietrele and Uivar in Romania (Hansen et al. 2006, 4–8, abb. 5–7; Schier 2009, 222–224), Okolište in Bosnia (Müller et al. 2011), and Öcsöd-Kováshalom, Berettyóújfalu-Herpály, Polgár-Bosnyákdomb and Polgár-Csőszhalom in Hungary (Raczky and Anders 2008, 2010).

Actually, Chapman had already outlined the importance of external spaces for early food production. Tells were densely covered by houses, and within their limited spaces it would have been impossible to cultivate plants and keep animals to feed the population. Consequently, most subsistence activities must have taken place in the wider environment (Chapman 1989, 34–39). Moreover, external spaces had to be shared following principles of the structured communal economy valid inside the tell to permit sustainable, long-term sedentary agriculture. According to Hodder (1990, 83–87), the house-centric world of tells corresponds to the domestic, *domus*, surrounded by the wild (*agrios*). These two spatial spheres represented a complementary dualistic relationship throughout the Neolithic.

There is a diversity of physical relationships between tells and contemporaneous horizontal settlements across Neolithic south-east Europe (Chapman 1981, 1997a; Kotsakis 1999, 2006; Bailey 2000, 174–177; Halstead 2005), with stratified mounds forming an

increasingly complex settlement structure impacting on horizontal sites adjacent to the tell and beyond (Chapman 1998, 113–118; 2010; Halstead 1999; Raczky and Anders 2008, 2010). Along the edge of the Balkan tell distribution area, Makkay (1982, 104–164) and Sherratt (1982) identified such a complex system, consisting of a tell and its numerous small, horizontal satellite settlements, in the Tisza culture of the southern Great Hungarian Plain (see also Parkinson 2006, 139–143). In the northern Great Hungarian Plain, only horizontal Tisza culture settlements are known, illustrating how dualistic settlement characteristics vary between geographical zones within this culture (Kalicz and Raczky 1987, 14–19; Makkay 1991; Raczky 1995).

CULTURAL PATTERNS C. 6700/6500–5500 BC

Between 6700/6500 and 6000 BC, the first long-term settlements in the south-east European Neolithic were built in Greece, Macedonia, Kosovo, and Bulgaria. They mirrored contemporary sites in Anatolia, including tells (Whittle 1996, 37–59; Chapman 1997a; Tringham 2000a, 19–26; Bailey 2000, 39–55; Rosenstock 2005, 225–233; 2009, 102–106; Perlès 2005; Guilaine 2007). The best-known early tells are Argissa Magoula, Otzaki Magoula, Prodromos, Achilleion, Anzabegovo, Vršnik, Veluska Tumba, Tumba Madjari, Rudnik, Karanovo, Tell Azmak, Čavdar, Rakitovo, Slatino, and Kovačevo (Fig. 12.1). Tells cluster in the alluvial areas of major river valleys, and avoid less favourable environments in between. For example, several tells are known from the Larissa Basin in eastern Thessaly and along the Maritsa and Tundja rivers and their tributaries in Bulgaria (van Andel and Runnels 1995; Perlès 2001, 125–131; Nikolov 2002, abb. 2). Horizontal settlements of various levels of integration (from household through hamlet to village, in dynamic interaction) can occur near these tells (Chapman 2008). Neolithic villages appeared with an explosive intensity in the Carpathian Basin around 6000 BC, possibly through the endemic diffusion of the Near Eastern ‘Neolithic package’ along the great river valleys (Tringham 2000a, 19–33, fig. 2.3; Biagi et al. 2005; Davison et al. 2006; Bocquet-Appel et al. 2009). However, there were initially no tells north of the central Balkans, where a more mobile way of life was served by less permanent, horizontal settlements. Houses built at a distance from each other enabled horticultural, small-scale household-level cultivation in the immediate proximity of buildings and permitted animal keeping nearby.

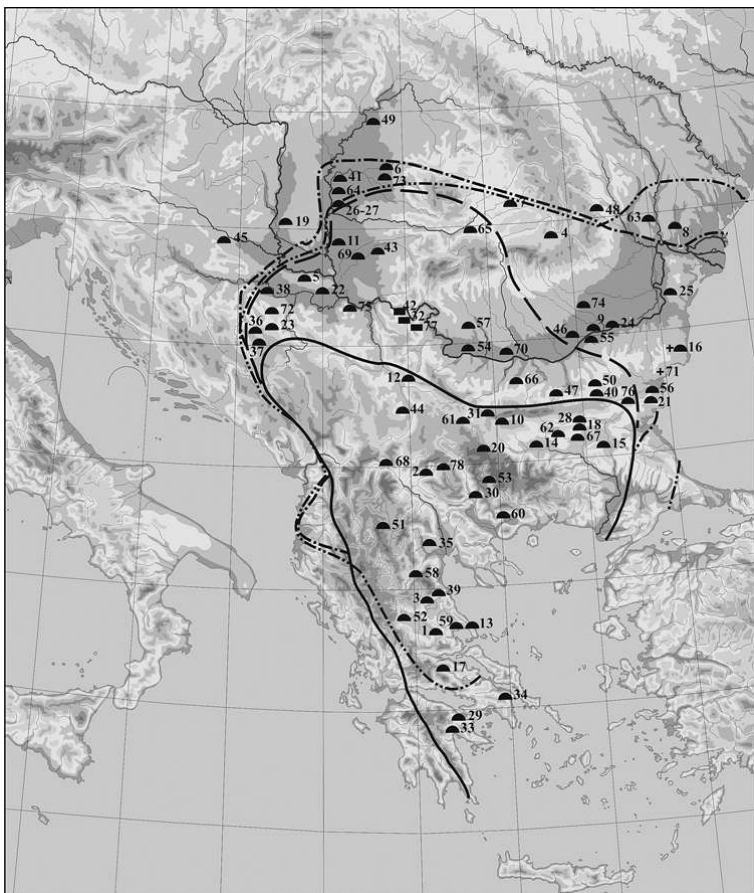


FIG. 12.1. The geographical distribution of Neolithic tell settlements in south-east Europe between 6700/6500 and 4600/4500 BC. Solid line: first phase of tell distribution, 6000 BC; dashed line: second phase of tell distribution, 5500 BC; dashed and dotted line: third phase of tell distribution, 5100/5000 BC; dashed and double dotted line: fourth phase of tell distribution, 4600/4500 BC.

Selected list of stratified (tell and tell-like) settlements and horizontal sites in south-east Europe. 1 Achilleion, 2 Anza, 3 Argissa, 4 Ariuşd, 5 Bapska, 6 Berettyóújfalu-Herpály, 7 Bernadea, 8 Bolgrad, 9 Caşciorale, 10 Čavdar, 11 Čoka, 12 Crnokalačka Bara, 13 Dimini, 14 Dolnoslav, 15 Drama, 16 Durankulak, 17 Elateia, 18 Ezero, 19 Fajsz-Kovácsdomb, 20 Gălbănik, 21 Goljano Delčevo, 22 Gomolava, 23 Gornja Tuzla, 24 Gumelnița, 25 Hârşova, 26 Hódmezővásárhely-Gorzsa, 27 Hódmezővásárhely-Kökénydomb, 28 Karanovo, 29 Korintosz, 30 Kovačevo, 31 Kremikovci, 32 Lepenski Vir, 33 Lerna, 34 Nea Makri, 35 Nea Nikomedeia, 36 Obre I, 37 Okolište, 38 Otok, 39 Otzaki, 40 Ovčarovo, 41 Öcsöd-Kováshalom, 42 Padina, 43 Parța, 44 Pavlovac, 45 Pepelane, 46 Pietrele, 47 Podgorica, 48 Poduri, 49 Polgár-Csőszhalom, 50 Poljanica, 51 Porodin, 52 Prodromos, 53 Rakitovo, 54 Rast, 55 Ruse, 56 Sava, 57 Sălcuța, 58 Servia, 59 Sesklo, 60 Sitagroi, 61 Slatina, 62 Stara Zagora, 63 Suceveni, 64 Szegvár-Tűzköves, 65 Tărtăria, 66 Teliš, 67 Tell Azmak, 68 Tumba Madjari, 69 Uivar, 70 Vadastra, 71 Varna, 72 Varoš, 73 Vésztő-Mágor, 74 Vidra, 75 Vinča, 76 Vinica,

During this initial, expansive form of subsistence strategy, time was conceived of in both horizontal and linear ways, respectively reflected in patterns of dispersed settlement networks and diffuse village plans in south-eastern Europe. These settlement forms facilitated mobility on a micro (household) and macro (community) scale. Variability within the house-hamlet-village system (Chapman 2008) offered a spectrum of adaptative possibilities and different mobility levels under divergent environmental conditions. One may also presume subsistence forms relying on different and complementary degrees and types of mobility (Halstead 2005, 45–49). As in the Near East, the basis of this system was the household unit, defined by its physical, economic, social, and ideological integrity (Flannery 1972, 2002; Tringham 2000b; Steadman 2000, 167–174; Borić 2008; Souvatzi 2008).

Following this expansive ‘settling in’, tells emerged in the southern Balkans during a residential consolidation phase within the context of the Protosesklo–Karanovo I–Kremikovci–Anzabegovo–Vršnik cultural complex (Runnels 2003, 127–129; Tringham 2000b, 116–120). Tells represented a new attitude towards built space and time, stressing the vertical dimension. These artificially erected communal structures, often in strategically important positions, accentuated distinguished geographical loci, thereby construing the external, physical web for the common mentality of communities, upon which cohesion within the controlled region could be based (Chapman 1997b; Gheorghiu 2008, 87–88). Each tell formed a horizontally defined, tightly aggregated system of houses. Their proximity to each other expresses a new form of self-definition, a special habitus on a community level or levels, beyond the household. The time depth of neighbouring house plots, which added authority and value, is expressed by the appreciation of earlier buildings, reconstructed on the same spot (Hodder 1998; Borić 2008). Using Sherratt’s (1997, 22) term, tells are ‘habitation monuments’. Specially arranged buildings with uncommon functions offer the clearest evidence for action at a communal level, for instance the 9 by 9m building from Tumba Madjari tell near Skopje, which yielded an artefactual assemblage indicative of a communal-ritual place (Sanev 1988). Similar buildings, for example at Nea Nikomedeia in Greece and Rakitovo in Bulgaria (Pyke 1996, 32, 48–49; Matsanova 2003), indicate that this was a general development in the Balkans at the time.

The relatively (?) mobile and adaptive ‘house society’ of the early Neolithic thus became integrated into the framework of the ‘tell society’ characterized by sedentism and a certain perception of time-

depth. Therefore, a duality in attitudes to space and time may be reconstructed for, respectively, horizontal and tell settlements, a duality already present in the 'Neolithic package' of food-producing economies (Sherratt 1997, 22; 2005, 143). It is possible that the tell/non-tell dichotomy is also reflected at the level of buildings, respectively constructed as above-ground wattle and daub houses on the mounds and less permanent, semi-subterranean dwellings in horizontal settlements (Lichardus and Lichardus-Itten 2004).

The expansion of early food production in the Balkans was mediated by the Starčevo culture and its communities, who encountered specialized foragers of the local Mesolithic Lepenski Vir culture in the Iron Gates Gorge of the Danube. Their characteristic trapezoidal houses and anthropo/ichthyomorphic stone sculptures were discovered at the riverbank sites of, among others, Lepenski Vir, Padina, and Vlasac. They reflect specific cultural responses to and relations between humans and their particular microregional environment between 9500 and 5500 BC within a closed ecological zone (cf. Borić 2008). There were interactions between the thinly spread local Mesolithic populations and immigrant, sedentary food-producing communities, but the Lepenski Vir settlement tradition eventually dissolved without trace into the early Neolithic Starčevo culture, without influencing subsequent cultural development (Tringham 2000b, 33–55; Kaczanowska and Kozłowski 2003, 228–231).

CULTURAL PATTERNS C. 5500–4600 BC

Between 5500 and 5100/5000 BC a clear north–north-west expansion of tell settlements took place throughout the Balkans. Mounds began occurring along the Bosna, Sava, Drava, and Maros rivers, beyond the Lower Danube and into Transylvania (Fig. 12.1). This is first apparent for the Dimini–Vinča–Kakanj–Karanovo III–IV cultures. Life at Vinča also began at this time (Chapman 1981, 6–32; 1998). At enclosed tells, houses were arranged in a strict order, often separated by very narrow alleys, making it difficult to access houses at the centre of the site (Chapman 1990). This offered an opportunity to mark the distinguished position of certain households. Meanwhile, the increasing concentration of houses limited the space in which individual and communal social interests could be played out, perhaps resulting in an increasing appreciation of living outside the tell and in the expression of prestige and status in a new arena outside the tell. This tendency may explain the creation of communal cemeteries, new places for negotiating individual and group interests (see Borić, this

volume). Most tells were enclosed by a combination of ditches, earthworks, and walls. Some, for instance Parța in Romania (Lazarovici et al. 2001), have buildings dedicated to special communal functions, indicated by atypical artefactual assemblages. The Vinča culture system of tells and numerous horizontal settlements continued the tradition of communal mentality as it developed in the southern Balkans. The broad geographical network of stabilizing food-producing economies and increasing social complexity were the likely driving forces.

By approximately 5100/5000 BC, the northward spread of settlement mounds reached the southern Great Hungarian Plain (Fig. 12.1), where the Tisza and Herpály cultures (Figs 12.2 and 12.3) include tell, tell-like (e.g. Tisza: Hódmezővásárhely-Kökénydomb, Hódmezővásárhely-Gorzsa, Vésztő-Mágor, Szegvár-Tűzköves, Öcsöd-Kováshalom; Herpály: Berettyóújfalu-Herpály) and horizontal settlements (cf. Tálas and Raczky 1987; Link 2006). The Polgár-Csőszhalom tell and its 34–35ha external horizontal settlement are located some 100km north of the main block of Tisza and Herpály tells (Raczky and Anders 2008). Its extreme size makes this site a special phenomenon in the late Neolithic of the region. A 3.5ha tell is surrounded by a multiple enclosure and palisade system, usually known from settlements in hilly Transdanubia (western Hungary) and the central European Lengyel culture (Trnka 2005; see Petrasch, this volume). The site is located at the meeting point of two major cultural regions and may represent a symbolic synthesis. Activities within the tell differed from those dictated by daily life in the horizontal settlement. Most likely, the tell and its external settlement reflect different attitudes towards space and time (Raczky and Anders 2008, 39–49; 2010). Sherratt's conclusion that this mound was an '*ersatz Tell*' seems correct: Polgár-Csőszhalom functioned as a continuously constructed communal monument, rather than an ordinary habitation mound (Sherratt 2005, 142–143).



FIG. 12.2. The tell settlement of Berettyóújfalu-Herpály with excavation trenches from 1977 to 1982.



FIG. 12.3. The tell settlement of Berettyóújfalu-Herpály. Detail of a north–south section showing the stratigraphic sequence.

New forms of spatial patterning, such as orthogonal street layouts with very narrow alleys, emerged within southern Balkan tells, among the later Dimini–Karanovo IV–V–Boian–Maritsa–Poljanica–Sava–Vinča–Pločnik–Sopot–Butmir cultures (e.g. Ovčarovo, Goljamo Delčevo, Poljanitza, Sava: [Todorova 1982](#)). The production of clay house models (*tectomorphs*) was interpreted as a token of continuity between subsequent household units and an active component of maintaining social stability through time ([Bailey 1990](#)). At Ovčarovo house 7 (layer IX), a special assemblage of clay figurines and a house

model indicates symbolic/sacral activities on a community level (Todorova 1982, 67–67, 135–136; Trenner 2010). Houses in tell communities were thus not simple dwellings but became symbols for household units (Tringham 2000b; Souvatzi 2008). Within late Neolithic tell communities, social interactions were realized on the level of household clusters. The periodical horizontal and vertical redefinition of houses implies the redefinition and/or reinforcement of community structure in a more abstract, social space. A strong ideological motivation may therefore also lie behind the cyclical and apparently intentional burning of houses at tell sites, an activity always followed by rebuilding (Tringham 2005).

The physical limitation of tells, however, also defined tight social spaces for household units within a community, eventually leading to the erection of multi-storied buildings on some tells (Fig. 12.4). They emphasized the significance of certain households in yet another vertical dimension (Hiller 2001), illustrating increasing social tension within aggregated household clusters.

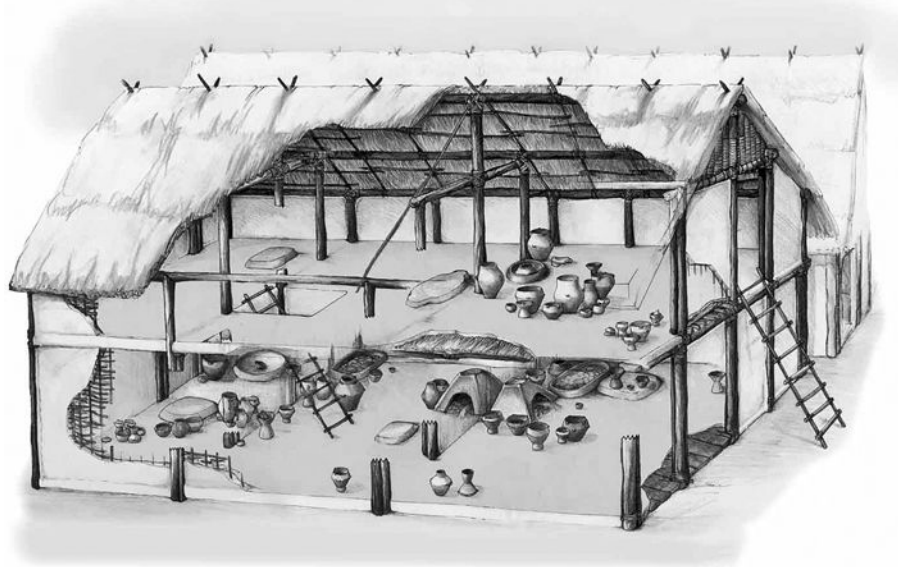


FIG. 12.4. The tell settlement of Berettyóújfalu-Herpály. Reconstruction of House 11, a two-storey building, with the objects found within.

LATE TELLS AND TELLS IN DECLINE: C. 4600/4500– 4000/3700 BC

Occupation at tells in the Great Hungarian Plain, the northern

periphery of tell distribution, lasted about 500 years, ending abruptly around 4600/4500 BC. The subsequent Tiszapolgár culture is characterized by a dispersed settlement pattern in the area between the Maros and Körös rivers (Parkinson 2006). The complex enclosures at the Polgár tell were filled in during a single major communal action, marking the symbolic end of the local community before the tell was abandoned. Similarly, there was a break in the southern region of early tell formation, including Thessaly and Macedonia, at several late Neolithic tells (Aram-Stern 1996, 90–101; Todorova 1998). At the same time, tell-forming communities continued in the central Balkan Kodžadermen–Gumelnița–Karanovo VI (KGK)–Varna, Vinča-Pločnik, and Krivodol-Sălcuța cultures (Todorova 1995; Hansen and Toderas 2010). There was also an expansion of the Balkanic way of life into Moldova, with sporadic stratified settlements supporting a more sedentary Eneolithic economy (Chapman 2010).

In the central Balkans, tell plans show the tight arrangement typical of the previous period. At Durankulak, Hamangia culture layers were covered by oblong megaron-type houses on stone foundations between layers VI and III. The excavators reconstructed a number of sanctuaries and a central ‘palace’, the latter dated to phase III of the Varna culture (Todorova 2002). This diversity of buildings must, to some extent, reflect underlying economic, social, and ideological differences. However, grave goods from the associated cemetery show that social differences were primarily expressed in burials, a new arena for displaying prestige and social status (Renfrew 1986; Chapman 1991; Slavchev 2010). Whilst some cemeteries are associated with tells, the large Varna burial ground could not be connected to any (Lichardus 1991). Possibly this cemetery, with its unusual quantities of high-prestige copper, gold, and *Spondylus* shell objects, was used by high-status individuals from several communities, with outstandingly rich graves amidst groups of more modest burials. The Varna cemetery thus represents a new, external space contrasting with individual tells and their communities (Renfrew 2003, 142–143; Higham et al. 2006). In this context, the appreciation of special individuals and their communities is realized through new artefact types, material representations of a new system of values (Manolakakis 2007) and new networks of procurement well beyond the earlier small, regional scale (Strahm 2007; Hansen 2009; Chapman, this volume).

Meanwhile, in the core area of the Balkans, earlier social customs were maintained within an altogether more peaceful development, for instance at Pietrele in Romania (cf. Hansen et al. 2007). Gumelnița culture tells display a prosperity similar to settlement mounds in the Vedea and Teleorman river valleys (Andreescu and Mirea 2008).

Around 4000 BC, tell cultures ended relatively rapidly in almost the entire area of the Balkans. Some special settlement mounds remained in use until c. 3700 BC, including Galatin in north-west Bulgaria, where a house with stone foundations is indicative of continued habitation. The decline and ultimate disappearance of tell-forming cultures in south-east Europe proceeded from the lower Danube region toward Dobrudja, Muntenia, and north-east Bulgaria. The sudden disruption has been explained by a combination of external circumstances, including the westward expansion of the Kurgan culture from the steppes and climatic change (Gimbutas 1979; Todorova 1998). Recently, scholars have sought a better understanding of a complex system of external and internal factors that would explain the all-encompassing historical change over both south-east Europe and western Anatolia (Parzinger 1998; Nikolova 2003; Hansen 2009; Anthony 2010).

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CHAPTER 13

DOMESTIC SPACE IN THE MEDITERRANEAN*

DEMETRA PAPACONSTANTINO

INTRODUCTION

THE fragmented way in which archaeologists perceive cultural developments in the Mediterranean has been examined extensively in the literature, and over the past decades several attempts have been made to conceptualize the heterogeneity of the region in more holistic terms (Blake and Knapp 2005; Papadopoulos and Leventhal 2003). This fragmentation in research is even more obvious when focusing on a specific theme, as this involves breaking down the barriers of several discrete archaeological traditions and basically constructing a new field of enquiry (Papaconstantinou 2007). The aim of the present chapter is to familiarize the reader with the available evidence for domestic space in the Neolithic cultures of the Mediterranean from the middle of the seventh millennium and to explore, however briefly, the insights a wide-ranging perspective can offer.

The role of the Mediterranean as the meeting point of two worlds, East and West, is illustrated uniquely in the study of domestic space during the Neolithic. For nineteenth-century northern Europeans, sedentary life, the construction of permanent structures, domestication, agriculture, pottery, and specific lithic technologies described a new, 'Neolithic', way of life laying the foundations of society as we know it. The concept of the Neolithic was introduced to eastern Mediterranean archaeology in the early twentieth century as part of diffusionist ideas and investigations into the reasons for the 'Neolithic Revolution' and its place of origin (Özdoğan 1995; Thomas 1993; Bar Yosef and Belfer-Cohen 1992).

Archaeology in the Near East soon indicated that the European checklist of attributes was unhelpful for describing the 'Neolithic phenomenon' in its initial stage. One significant problem was the weak correlation between sedentary life and domestication, an 'anomaly' even more dramatic given the depth of deposits and density

of structures, unparalleled in Europe. ‘Anomalies’ of this kind increased over time, and current research in the eastern Mediterranean indicates that sedentary life and the creation of large, socially coherent communities started long before the adoption of agriculture and domestication, which here characterize the end, not the beginning, of the Neolithization process (Watkins 2006, 4–5; Lichter 2005b, 2–7).

Initial analysis of domestic space aimed at identifying the basic units of production, distribution, and consumption within each community through household studies. The most powerful explanatory model for the transition to the Neolithic in the eastern Mediterranean, still in use, relates directly to the use of domestic space and ‘reads’ the transformation of productive units, from compounds to nuclear families/households and eventually extended households, through the specific form and use of buildings (Flannery 1972, 2002; see discussion in Banning and Chazan 2006). In the western Mediterranean, domestic structures were less conspicuous, and research concentrated on processes of colonization, relations to the Near East, and the Mesolithic–Neolithic transition (Price 2000).

The appearance of the Neolithic in Europe as a ‘package’ of certain characteristics, the restricted number of deep habitational deposits, the clearer distinction between functional and symbolic spaces, and the long tradition of Palaeolithic studies had specific effects on the study of domestic space, directing research towards settlement patterns and artefact distributions rather than examining structured space (Papaconstantinou 2006, 15–27). Hence, discussions revolved around borders and markings in the landscape, activity areas, depositional patterns, the construction of cultural and social identities, and the acquisition of power and authority (Bailey et al. 2005, 2008; Jones 2008; Robb 2007; Souvatzi 2008).

In recent years, dissatisfaction has often been expressed with the study of Mediterranean Neolithic settlements, targeting both the simplistic models of cultural uniformity and demic diffusion put forward for the Neolithic cultures in Mediterranean Europe and the inability of research in the eastern Mediterranean to identify discernible patterns in the diversity of observed cultural changes (see discussion in Robb 2007, 2; Tringham 2000, 22; Watkins 2008). Emphasis is now placed on the need for multiscalar perspectives incorporating insights from all different archaeological traditions (Robb 2007; Banning and Chazan 2006). The exploration of aspects of temporality and materiality in the archaeological record and the move away from archaeological narratives based on upheavals, revolutions, and universal identities (Gamble 2007) point to the same direction.

PATTERNS OF CO-RESIDENCE AT A MACROSCOPIC SCALE: AN OVERVIEW OF DOMESTIC SPACE

The landscapes of Greece and Italy are strongly marked by the formation of the first Neolithic villages. These new patterns of co-residence embody the emergence of new conceptions of group identity and the centrality of the house as a spatial entity around which communities develop and organize their social life.

Greece

The Neolithic period in Greece lasted for over two millennia (7000–4500 BC) and is divided into early, middle, and late ([Souvatzi 2008](#), 52–53; [Lichter 2005a](#); [Andreou et al. 2001](#); [Perlès 2001](#), 64–97). The existence of an earlier, pre-pottery phase is still disputed, whilst the transitional period to the Bronze Age, the final Neolithic or Chalcolithic (4500–3300/3100 BC), lasted at least another millennium.

Regionalism and diversity characterize the Greek Neolithic and it is hard to assess whether they are the result of cultural developments or archaeological practices. Especially with regard to archaeological practices, one should note that for this region they had the additional goal of providing the ‘European link’ to the Near East and were, therefore, primarily concerned with ceramic seriations and cultural continuity ([Papaconstantinou 2006](#), 81–85).

The variety in construction materials and spatial arrangements within and between settlements, as well as habitation density in certain regions or periods—there are ‘more than 300 [settlements] in eastern Thessaly alone’ ([Johnson and Perlès 2004](#), 65)—constitute two of the most significant characteristics of domestic space in Neolithic Greece, and sometimes sharply contrast the cultural uniformity and stability observed in the continuous, long-term habitation of many settlements ([Demoule and Perlès 1993](#), 363; [Efstratiou et al. 1998](#), 58).

Neolithic houses in Greece can range from oval huts with floors dug into the ground to rectangular or ‘megaron’-type structures (i.e. elongated and fronted by a narrow ‘porch’), from well-defined free-standing entities to more compact spatial arrangements with semi-enclosed areas and courtyards, and can have single or multiple rooms with internal divisions, upper storeys, or basements. Construction materials vary, from wattle and daub walls with stone or trench foundations to mud brick or pisé walls on stone foundations. The floors are usually of beaten earth, or sometimes wooden planks

(Aslanis 2010, 39–53, Perlès 2001, 186–91; Andreou et al. 2001). At late Neolithic Dikili Tash, there is evidence for careful re-plastering of the walls, and laboratory analysis indicates the use of different kinds of clay for different constructions (walls, roofs, floors, ovens, and benches) (Koukouli-Chrysanthaki et al. 1996, 686–88, see also Koukouli-Chryssanthaki and Treuil 2008).

A similar diversity is observed in the arrangement of domestic activities, as structural features (hearths, cooking and storage facilities, benches, shelves, platforms, and a variety of pits) are present both inside and outside the structures. This diversity is evident regardless of the general organization of the settlements. Thus, two of the most extensively excavated sites in Thessaly are Sesklo (middle NL), a densely built-up tell with an extended settlement spread on the slopes of the surrounding hills, and Dimini (late NL), a settlement with a looser plan and semi-enclosed habitation units. Despite their different layout, both show high variability in the use, production, and distribution of material culture (Souvatzi 2008, 105–6, 150–3; but see Kotsakis 2006 for differences in pottery distribution at Sesklo).

Habitation sites in Greece fall mostly into two main categories: long-term, permanent villages forming tells (Sesklo, Dimini, Dikili Tash, Makri), and flat, constantly shifting but extensive settlements (Makriyalos, Stavroupolis). Enclosure walls and ditches are common at sites of both categories (Sesklo, Dimini, Makriyalos). There is also evidence of cave occupation (Franchthi, Alepotrypa) and lake villages (Dispilio) (Demoule and Perlès 1993; Papathanassopoulos 1996; Andreou et al. 2001, Grammenos 2010, 31–37).

The distinction between tells and extended sites has raised discussions about social differentiation and property rights (Kotsakis 1999). Furthermore, the existence of certain types of architecture (megaroid), along with indications of mortuary rituals especially towards the very end of the period, have led to suggestions for emergent élites (Halstead 1984; see discussion in Andreou et al. 2001, 267). In general, however, there are no clear indications of social inequality (Demoule and Perlès 1993, 385). The deceased, mostly found in primary and secondary burials in settlement deposits, at the edges of settlements, or in ditches, are not prominently visible, and central courtyards and larger structures are usually related to storage areas and communal spaces, rather than areas with restricted access occupied by élites (see Makri: Efstratiou et al. 1998, 24–26; Dimini: Souvatzi 2008, 107–160) (Fig. 13.1). This pattern seems to reinforce the central role of the house in social reproduction and emphasizes the greater significance of the community over the individual.



FIG. 13.1. A post-framed structure typical of the main habitation phase of Makri in Greece (middle of the sixth millennium BC).

(Image courtesy of N. Efstratiou).

Although there is evidence for possibly intentionally burnt houses and for ‘ritual’ deposits in domestic contexts, their elusive character and association to utilitarian, residential deposits make the excavators rather reluctant to accept a purely ritual interpretation (cf. [Treuil and Tsirtsoni 2000](#); [Koukouli-Chrysanthaki et al. 2005](#)).

Italy

The Italian Neolithic (sixth to fourth millennium BC) is divided into early and middle (sixth to fifth millennium BC) and late-final phases (late fifth to early fourth millennium BC), with a transition to the Copper Age in the later fourth and early third millennia BC.

Early and middle Neolithic cultures in peninsular Italy and Sicily, and adjacent areas such as Malta and Dalmatia, are sedentary farmers

(Malone 2003; Robb 2007). The most characteristic construction technique was that of wattle-and-daub walls, either with stone foundations or set in postholes within footer trenches, forming circular, oval, or roughly rectangular single-roomed houses. Structural features such as hearths, ovens, and pits of all kinds were found inside and outside the houses, although most activities took place in open areas (many cobbled with small stones or plastered with clay). Evidence of knapping, firing pottery, cooking, butchering, and processing food suggests those must have been communal, shared activities in the villages.

Agglomerations of houses in the form of villages, often enclosed with a ditch, constitute the most common type of habitation, most characteristically on the Tavoliere in northern Puglia, but also in the south at Matera, in south-eastern Sicily, and along the Adriatic at the southern margins of the Po valley. Other types also exist, such as dispersed settlements (e.g. Acconia in southern Calabria), small upland habitation sites with a mixed wild-domesticated economy, and lake villages (see Menotti, this volume; for a list of sites, see Malone 2003; Tiné 2009). In many Tavoliere villages, the architectural division of space was carried further with smaller 'c-ditches' bounding individual house compounds (Robb 2007, 91).

Ritual life is rather muted (Robb 2007, 260), and houses do not seem an important medium of self-presentation, showing no variation in size, decoration, or architectural elaboration. This indicates a rather structured microenvironment around the house, standing 'in contrast to the flexible access, movement, perception, and interaction typical of the open, collective areas of the village' (Robb 2007, 87). The end of a household's life span is particularly intriguing, with many houses burned intentionally (e.g. Acconia, Balsignano; Robb 2007, 87–90; see also discussion in Tiné 2009). The evidence of on-site burials shows varied practices, such as disarticulation, skull manipulation, or curation, and can probably be understood by considering the role of burial in constructing group identity (Robb 2007, 56–65).

A significant shift in the role of domestic space takes place in the late Neolithic. Ditched villages are replaced by dispersed settlements, with a less nucleated and delimited habitation space. Cemeteries of individual graves or small collective tombs appear for the first time (Robb 2007, 313–14, Malone 2003, 256–57). This shift of emphasis away from houses as the focal point of the community, and the increasing conceptualization of genealogical relatedness expressed in burials, could suggest a shift from a situation where identity and heterarchy were conceptualized in terms of locality and co-residence (the production of difference), to one increasingly relying on the production of similarities (see Robb 2007, 337).

Iberia

Evidence from both ends of the Mediterranean basin, Iberia and north-western Turkey, is less well defined, but in both cases a stronger persistence of Epipalaeolithic hunter-gatherer traditions into the Neolithic seems likely ([Price 2000](#); [Özdoğan and Başgelen 1999](#)). In Iberia, secure evidence for a Neolithic culture (pottery production, plant and animal domestication) appears at c. 5500 BC, from Valencia and Catalunya in the east, through western Granada and central and southern Portugal. The Copper Age begins around 3000 BC ([Chapman 2003](#), 113–114; see also [Diniz 2008](#)).

The earliest evidence (mainly from caves in Valencia and Aragón) indicates the simultaneous existence of Epipalaeolithic technological traditions and fully Neolithic hunter-gatherer groups who had adopted technological and economic innovations (pottery, lithics, domesticates; [Ribe et al. 1997](#), 67; [Zapata et al. 2004](#)). Excavations at Cuartillas in the lower Aguas valley and at Almazaraque revealed ephemeral circular structures on artificial terraces and storage pits ([Chapman 2003](#), 117), whilst complete sedentarization is suggested for sites like Barranc d'en Fabra, Catalunya, with its oval huts with dry-stone walls, floors, supports, and combustion structures ([Bosch et al. 1992](#)). One of the most significant open-air sites is La Draga, an underwater shore site with remains of wooden structures with posts and planks, stone platforms, and numerous hearths and granaries, indicating long habitation ([Price 2000](#), 11; [Zilhão 2000](#), 150; [Bosch et al. 2000](#)).

Around the second half of the fourth millennium BC, caves and shelters are progressively abandoned and open-air settlements spread and increase in size. Evidence from Catalunya (Bòbila Madurell and Ca n' Isach) indicates post-built rectangular houses and the pursuit of everyday practices near fireplaces and hearths in habitation areas with storage pits ([Ribe et al. 1997](#), 76). At the very end of the Neolithic period, ditches surround habitation areas (e.g. Papa Uvas in the south). In the Copper Age, well fortified settlements become even more common ([Martin De La Cruz 1997](#), 15–24).

Anatolia

Neolithic deposits in Anatolia date from the ninth millennium BC and are best known from two very distinct cultural groups: the south-eastern part of the peninsula, close to the Euphrates valley, north Syria and the Levant (Çayönü, Nevalı Çori, Göbekli Tepe); and central Anatolia (Asikli Hüyük, Can Hasan III, Çatal Höyük). Despite their differences, these communities share common mechanisms to secure

their coherence and social stability: a high standardization in domestic architecture and works of high symbolic content, such as common ceremonial buildings and centralized rituals within settlements, or house interiors with intramural burials, wall-paintings of animals, and bucrania (Özdoğan and Başgelen 1999).

Neolithic evidence from western Anatolia and its Mediterranean coastline is less well documented, since research in the area only intensified in the past 20 years. So far, deposits reveal mostly cultures with a ceramic tradition (though not fully Neolithic in their subsistence strategies) and are dated from the middle of the seventh to the sixth millennium BC. There are at least three distinct groups: one in the Marmara region to the north-west of the peninsula (Mentese, Illipinar, Fikirtepe, Hoca Çeşme, Aşağı Pinar), one in the Izmir region near the Aegean coastline (Ulucak Höyük), and one in the Lake District to the south (Hacilar, Bademagaci) (Özdoğan 1999, 2003).

The most striking element in the architectural tradition of Mediterranean Anatolia is the combination of different cultural traits. Construction techniques draw both from central Anatolia (heavy use of mud: mud-slab and mudbrick buildings, often with stone foundations) and the Balkans (wattle and daub), in some cases occurring simultaneously in the same settlement (Mentese: Roodenberg and Alpaslan-Roodenberg 2008, 11).

The variety in architectural traditions is even more striking when compared to differences among other types of material culture. In the Fikirtepe culture of the Marmara region, for example, sites share the same pottery and bone tool inventories, but their architecture, subsistence, and lithic industry vary considerably. The sites of Fikirtepe and Pendik consist of round and oval wattle-and-daub huts with semi-subterranean floors and present a lithic tradition and subsistence pattern (mainly hunting and fishing) closely linked to the indigenous Epipalaeolithic Agaçli group, whilst Illipinar consists of rectangular mud or mudbrick structures reinforced with wooden posts and draws from the central Anatolian tradition (Özdoğan 1999, 212). Elsewhere in the Marmara region, the relation to Anatolia is even stronger. At Hoca Çeşme, for example, there are substantial circular structures with wooden posts sunk into the bedrock (Özdoğan 1999, 217) and heavy use of mud and re-plastering, marking a clear departure from any European or Epipaleolithic tradition and resembling central Anatolian traditions of treating and maintaining a house. The Anatolian origin of the finds assemblage in Hoca Çeşme makes the presence of circular houses even more puzzling, especially since by this time round buildings had long been abandoned in Anatolia (Özdoğan 1999, 218).

Regardless of the similarities in construction, however, it is

important to stress that spatial arrangements within western Anatolian settlements are in sharp contrast to central Anatolia. Central Anatolia is characterized by an agglomerate architecture of lengthy sequences of cell-like structures densely clustered in blocks, with access often from the roof and activities taking place both there and inside the house. Western Anatolian settlements, on the other hand, have plentiful open spaces. Freestanding one- or two-roomed houses with ground-level entrances are laid out in rows abutting one another or divided by narrow alleys (Schoop 2005, 49). There is abundant evidence (ovens, hearths, rectangular clay bins, platforms) for food storage and processing indoors and in the small outside courtyards usually associated with each building. The large open squares and simple walls of some sites have often been related to a high dependence on and tight control over domestic animals (Roodenberg and Alpaslan-Roodenberg 2008, 9).

Finally, the latest deposits of several sites in the Marmara region (Hoca Çeşme, Aşağı Pinar, Mentese, Ilipinar) indicate affiliations to the Bulgarian Karanovo culture. Domestic structures are rectangular and have interior features such as clay platforms, bins, and domed ovens (Fig. 13.2). Along with the rest of the material culture, this indicates a clear shift in interaction sphere and has no resemblance to Anatolian assemblages (Özdoğan 1999, 218).



FIG. 13.2. House No. 4.7, Asagi Pinar layer 4, western Anatolia. The building is contemporary with the Karanovo III-IV transition at the end of sixth millennium BC.

(Image courtesy of M. Özdoğan).

The Levant

Further to the east, the Mediterranean corridor in the Levant has been identified as the formation zone of the Neolithic, and although its primacy is currently disputed ([Watkins 2008](#)), it nevertheless presents the earliest information of sedentary communities, starting from the Epipalaeolithic Natufian culture (eleventh millennium BC) ([Watkins 2012](#); [Cauvin 2007](#); [Kuijt 2000](#)).

The second half of the seventh millennium marks the end of a very long period of pre-pottery Neolithic cultures which, starting from small hunter-harvester communities, managed to coalesce into a quite distinctive whole (known as PPNB, i.e. Pre-Pottery Neolithic B). The PPNB is characterized by large, organized settlements, extremely complex houses (multicellular and multipartite), distinctive transformative technologies (such as, apart from lithics, the production of lime plaster for manufacturing hard floors, domestic installations, sculptures, and vessels), domestication of plants and animals, and a revolution in symbolic culture manifested in mortuary rituals (plastered skulls), on-site ritual centres, and even regional funerary centres (for fuller discussion, see [Kuijt 2000](#); [Akkermans and Schwartz 2003](#), 57–67). By the end of the seventh millennium this whole system seems to collapse, the Pottery Neolithic is introduced, and the area is characterized by a mosaic of regional cultures, population movement, and a decrease in site numbers.

Evidence from the Pottery Neolithic on the northern coast is rather limited, and the most significant developments are manifested near the Syro-Turkish borders, in the Halaf culture (c. 5900–5300 BC) ([Akkermans and Schwartz 2003](#), 106–115). There are, however, habitation sites in the southern Levant, especially of the Yarmukian culture (Sha'ar Hagolan, Munhata, Hamadiya, Megiddo, 'Ain Ghazal, Byblos), indicating the existence of small villages. Houses are built in mudbrick on stone foundations and can be rounded, rectangular, single- or multicellular (Munhata, 'Ain Ghazal). Reconstructing household activities is difficult, but small circular mudbrick silos or plaster-lined basin installations do exist ([Gopher 1998](#), 209–211, 220; [Garfinkel and Miller 2002](#), 82–83).

The site of 'Ain Ghazal east of the Jordan valley is an important exception to the general pattern of severe disturbances. Its long, constant occupation for over 2,000 years (7250(?)–5000 BC) and its population explosion by 6000 BC into a densely occupied 15ha settlement with an estimated population of 2,500 support suggestions for population influx from abandoned settlements in the area. Apart from the evidence for 'public buildings' and 'ritual deposits', there is significant diversity in domestic architectural types throughout the

site's occupation, as well as rich material culture inventories. These have allowed hypotheses on the nature of social transformations and the identification of different households (nuclear vs. extended families, farmers vs. pastoralists) ([Rollefson 1997, 2000](#)).

Burial customs in the Pottery Neolithic changed dramatically. Intramural burials containing one flexed individual without grave goods (in some cases underneath floors, but often in shallow pits dug into abandoned trash) show that the house is still symbolically connected to the dead, but the PPNB custom of skull removal, related to ancestor worship, no longer exists. Separate extramural graveyards, common also in the Chalcolithic (from 4500 BC), probably begin now ([Gopher 1998, 218–220](#)).

Cyprus

The island of Cyprus is significant for its considerable number of extensively excavated and well-preserved Neolithic sites. Even more noticeable is the idiosyncratic character of its built environment compared to the nearby mainland. Cypriot aceramic cultures were initially part of short PPNB colonization waves from the Levant, but by the seventh millennium Cyprus develops insular characteristics which persist throughout the aceramic phase (ending in the sixth millennium BC) and into the end of the Ceramic Neolithic (first half of the fourth millennium) ([Peltenburg and Wasse 2004; Swiny 2001; Guilaine and Le Brun 2003](#)).

There are two significant patterns in relation to domestic architecture. The first concerns the type of architecture and domestic space in aceramic sites (*Khirkitia Vounous*, *Kalavassos Tenta*) and the existence of circular houses several centuries after their disappearance on the mainland ([Le Brun 2001, 2005; Peltenburg 2004](#)). More specifically, sites are densely built, enclosed by walls, and divided into segments by alleys and courtyards ([Fig. 13.3](#)). Individual structures are arranged in compounds and built of stone and mud (mudbricks or pisé), whilst their interior is usually subdivided by low partition walls, platforms, and sometimes a kind of loft resting on pillars. Floors were mud-plastered, and interior walls were also plastered and occasionally embellished with painted murals ([Le Brun 2001, 114–115](#)). The maintenance and constant rebuilding of the houses onto the underlying deposits, usually without foundation trenches, as well as the heavy use of plaster, strongly resemble mainland traditions, but in Cyprus these are applied on a different, circular, architectural type. Burial practices, though intramural, differ from the mainland and comprise single, primary inhumations without any evidence for special treatment of the skulls ([Le Brun 2005, 115](#)).



Fig. 13.3 Complex of structures, Khirókítia *Vounous*, Cyprus.

(Image courtesy of A. LeBrun).

The second notable pattern relates to ceramic Neolithic sites (Ayios Epiktitos *Vrysi*, Sotira *Teppes*) and a change in depositional practices. Ceramic Neolithic sites yield rich inventories of useable items from floor assemblages, a practice continuing to the succeeding Chalcolithic, but in sharp contrast to the abandonment processes of the aceramic tradition, when houses were mainly emptied out. Many of these deposits have been related to ritual abandonment and closure ceremonies. In association with the first appearance of pottery and the disappearance of intramural funerary practices, these new depositional practices indicate a shift in the rules of material engagement and the symbolic value between burials, houses, and artefacts (Peltenburg 2003, 114; Papaconstantinou 2010).

CHANGING THE RULES OF MATERIAL ENGAGEMENT: IDENTITY IN THE MAKING AND THE ROLE OF DOMESTIC SPACE

Domestic space and the organization of the built environment in the Neolithic Mediterranean constitute the means communities used to make concrete their central choice for co-residency and cooperation (see also Watkins 2004). The comparison of their morphological characteristics indicates great variability: distinctions in materials and

construction techniques, differences in repairs and rebuildings, various types of spatial demarcation of domestic activities.

The view from a large-scale perspective supports the idea that, compared to western regions, the east Mediterranean has a longer tradition in this process, resulting in greater standardization of architectural patterns, greater differentiation and segmentation of space, and a more 'canonical' behaviour regarding communal life and its organisation.

Having acknowledged the importance of that pattern, however, it is significant to understand what these differences stand for.

The comparison of morphological characteristics, as part of an initial 'cartography' of the evidence, is useful for analysing how communities set rules of co-existence and organized their built environment. But diversity is not self-explanatory, and these kind of typological schemes, seen from a comparative perspective, seem to have value only if used within evolutionary-diffusionist models. Otherwise, they reveal the limits of our discourse, leading to geographically sweeping generalizations, overemphasizing variability, and eventually masking genuine local diversity by insisting on difference at all scales (Bradley 2005; Tringham 2000).

The Neolithic Mediterranean is a good example in that respect. Since it is now clear that there is no simple demic diffusion from the heartland of south-west Asia across Anatolia towards south-east Europe (Watkins 2004, 2008; Lichter 2005b), it is also evident that Neolithic domestic space, despite sharing some morphological characteristics throughout this geographical area, acquired different roles (functional-symbolic), developed out of different processes (sedentary gatherers vs. sedentary farmers), and probably came to mean very different things.

If change is indeed 'an experience articulated through novel material metaphors' (Gamble 2007, 278), then major structural changes like those witnessed in Neolithic societies might be better understood as changes in the *rules* of material engagement that affect both social reproduction and the construction of identity, rather than in material culture per se.

So far, discussions on materiality have concentrated mostly on certain types of artefacts or raw material, emphasizing their 'ascribed social value' and their role in the self-creation of identity (Renfrew 2001, 2004). More recent discussions, however, approach material culture not as a simple reflection of systemic developments but as 'things [which] were in contest rather than "there", and becoming rather than complete' (Wobst 2000, 47; see also Lucas 2008), and indicate the need to explore new ways of narrating the past, moving away from particular occurrences, and towards an understanding of

the way things related to each other (see discussion in [Lichter 2005b](#), 6; [Schoop 2005](#), 45; [Watkins 2004](#), 9; 2006; [Gamble 2007](#), 257, 263).

In that context, domestic space as the environment in which different categories of material culture come together and create new conceptual arrangements and major structural changes, provides a whole new ground for analysis and becomes a field with much greater potential.

The differential rates of change between architectural styles and different kinds of material culture in western Anatolia, or the changing symbolic (?) role of certain floor assemblages in depositional practices in ceramic Neolithic Cyprus, are good examples of such a new perspective (see [Hodder 2006](#), 237–258; see also [Papaconstantinou 2010](#)). Narratives of the human past would in this case focus on the construction of multilayered identities on a local basis, without needing a checklist. For interpretations to be different, questions must be different, and archaeology has the advantage of being able to explore not only processes of inhabitation, but also the conditions under which places became uninhabitable, as well as the reasons why people decided to move on and leave past lives and things behind.

It has often been said that our interpretations lack ‘the human presence’, that we should try harder and put ‘faces’ in our reconstructions of the past. The truth is, however, that we have never stopped seeking for people, talking about them, imagining their lives, reconstructing their everyday activities. Up to a point this is inevitable, since archaeology’s scope is to explore ‘life in the past’. It is strange, however, that our narratives sometimes make it much easier to ‘visualize people’ than to deduce the state in which prehistoric settlements were actually found, how they were abandoned, what happened whilst they were deserted, or how the rules of material engagement towards specific types of objects changed from phase to phase and were related to certain practices.

Such stories are yet to be told and could be equally engaging. They could provide a more lively canvas for the ‘emplotment’ of our anthropologically informed interpretative models, and most importantly highlight and enrich the role of archaeology as a discipline in adding new dimensions and perspectives to the understanding of human culture.

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CHAPTER 14

LONGHOUSE LIFESTYLES IN THE CENTRAL EUROPEAN NEOLITHIC

JONATHAN LAST

INTRODUCTION

ALTHOUGH named after its characteristic pottery, the Linearbandkeramik (LBK) culture is perhaps better defined by its buildings: there are hard-and-fast rules which allow us to recognize an LBK longhouse from western Hungary to eastern France (Stäuble 2005a, 207).¹ In the 70 years since the first major publication (Buttler and Haberey 1936), research on LBK houses has primarily attempted to define functional categories of building (e.g. Modderman 1970, 100–120) and tease out local sequences (e.g. Stehli 1994). Perhaps because of their resemblances to the later long barrows of north-west Europe, British archaeologists have more readily engaged with the symbolic dimensions of houses (e.g. Hodder 1990; Bradley 1996). Both approaches, however, present rather static, idealized views (Hofmann 2006, ch. 3); detailed considerations of how longhouses were inhabited in practice remain rare.

In the 1980s, knowledge of LBK houses and their middle Neolithic (MN) successors (together termed the ‘Danubian’ tradition) was synthesized by Coudart (1998) and Hampel (1989). Since then, important new research directions have been established, with significant implications for understanding houses. One is the study of the ‘earliest’ (*älteste*) LBK, mostly in Germany and Austria (Stäuble 2005a), which has raised questions about the development of the ‘typical’ later longhouses and the use of space in and around them. A second research area has drawn on isotope studies of human and animal bones to highlight social aspects of houses and households, such as migration, marriage, and transhumance (Bickle and Hofmann 2007). Finally, the growing evidence for violence, both real and symbolic, in the late LBK (e.g. Orschiedt and Haidle 2006; Bentley et al. 2008) should inform our understanding of the transition to the MN, with its regionally distinctive house forms.

The LBK spans the second half of the sixth millennium BC, whilst the regionally circumscribed MN cultures (including Lengyel, Stichbandkeramik, Großgartach, Rössen, and Villeneuve-Saint-Germain) cover the first half of the fifth millennium. For the purposes of this chapter, I divide the LBK into three stages—early (*älteste*, c. 5500–5250 BC), middle (sometimes termed ‘Flomborn’, c. 5300–5150 BC) and late (c. 5150–4950 BC)—whilst noting that questions remain about the chronology of the early stage (Gronenborn 1999, 153–156), the duration of the overlap between early LBK and Flomborn (Cladders and Stäuble 2003), and regional variations at the end of the LBK (Farruggia 2002).

HOUSES AS MICROCOSMS

Although the traditional LBK house typology of *Großbau* (type 1), *Bau* (type 2), and *Kleinbau* (type 3), first set out by Modderman (1970, fig. 12), has been subject to revision and critique (cf. Coudart 1998, this volume; Birkenhagen 2003), observed variation in house form remains limited. The key structuring principles of LBK longhouses include: their rectilinear or slightly trapezoidal groundplan; their orientation, which shows systematic regional variation (Mattheußer 1991); their modular construction, with buildings comprising particular combinations of north/west, central, and south/east parts; the division of internal space by numerous transverse rows of three posts, producing a four-aisled structure; and the presence of elongated pits flanking the long walls. Collectively, these make up a ‘linear house’ with a ‘dramatic effect of sequence and order’ (Hodder 1990, 119) (Fig. 14.1b).

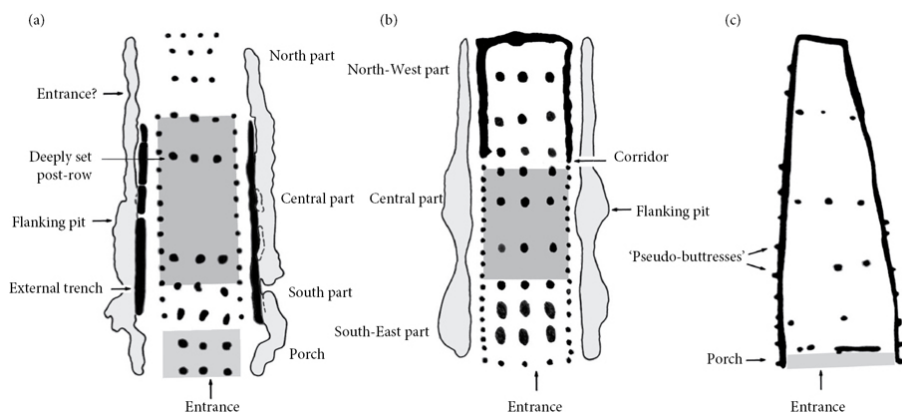


FIG. 14.1. Representative house-plans: (a) early LBK (after Stäuble and Lüning 1999, fig. 1a); (b) middle/late LBK (after Lüning 2000, fig. 53); (c) MN (Rössen;

after [Coudart 1998](#), fig. 93a). Not to scale.

However, recent studies of early LBK longhouses have modified this picture. In a revision of the Modderman typology, [Cladders and Stäuble \(2003](#), fig. 2) summarize the differences exhibited by the early buildings, including: a more trapezoidal shape; an orientation closer to north/south; a different logic to the modules; a reduced number of internal posts, especially in the central part; and trenches or gullies between the long walls and the flanking pits ([Fig. 14.1a](#)). The origins of these houses are still poorly understood, but may lie in the Starčevo-Körös tradition ([Gronenborn 1999](#), 159; [Bánffy 2004](#)). Whatever their genesis, they formed a stable and widespread architectural tradition and clearly played a key role in creating LBK cultural identity. Around 5300 BC, alterations in house form were synchronized with changes in other aspects of material culture, notably pottery, and with a further stage of LBK expansion. The Flomborn houses represent a sudden development following a long conservative phase, rather than a gradual transition ([Cladders and Stäuble 2003](#)). However, the two styles appear to have overlapped, possibly for more than a century, although rarely on the same site. So, rather than representing an unchanging cultural backdrop, house form served to differentiate groups or traditions within the LBK and was actively deployed in creating new identities.

Houses may have been particularly important because they established homologies between aspects of human society and cosmological principles, as in many ethnographic examples (e.g. [Hugh-Jones 1979](#), 236; [Waterson 1990](#), ch. 5). Their orientation may have referenced a deep history based on a sense of shared origins ([Bradley 2001](#)), even though local chronologies and the general lack of evidence for repair and renovation indicate that individual buildings had relatively short lifespans. Thus, in the Merzbachtal area of the Rhineland, some 15 phases fit into a period of roughly 300 years ([Stehli 1994](#)). This suggests analogies between the lives of houses and people, with buildings possibly abandoned on the death of the household head ([Bradley 1996](#); [Zimmermann et al. 2005](#), 16).

However, abandoned houses also had an afterlife. The scarcity of intersecting groundplans at most sites shows they survived as visible ruins which were not built over, and their significance was sometimes remembered for many generations, for example, at Bozejewice in Poland, where a late Lengyel house was directly superimposed on an LBK one ([Midgley 2006](#), 9). Houses may therefore have established links between the different temporalities of everyday life and the world of the ancestors ([Marciniak 2004](#), 131). Some practices varied regionally, however: rebuilding houses on the same spot seems more

common in east-central Europe (e.g. [Pavúk 1994](#); [Grygiel and Bogucki 1997](#)), which perhaps reflects principles prevailing on tell sites.

The differences between early and later houses can shed some light on symbolic meanings. For instance, the more open central space in the early stage suggests that the proliferation of post-rows in later houses had no structural necessity ([Cladders and Stäuble 2003](#), 495; [Whittle 2003](#), 138). Perhaps the conspicuous consumption of timber and the increased labour reflected a need for larger social networks in the context of settlement expansion and forest clearance. Internal posts often play an important symbolic role (e.g. among the Toraja of Sulawesi: [Waterson 1990](#), 89), and for [Stäuble \(2005b\)](#) the deep post-row at the rear of the central part of early LBK houses was the conceptual and structural axis of the building, perhaps continued by the ‘corridor’ of two closely set post-rows commonly found in the equivalent place within later longhouses.

Following the break-up of the LBK, the MN cultures incorporated a mixture of Danubian and exotic influences (e.g. [Hauzeur and van Berg 2005](#)). House forms were accordingly more regionalized, though longhouses still formed a key part of group identity and maintained some core principles, such as the cross-rows of three posts. Only in the Lengyel culture, within the area of Balkan influence, was this replaced by internal divisions of five postholes ([Pavúk 2003](#)). Within an overall context of greater diversity ‘select tendencies of LBK architecture are isolated and magnified’ in the MN ([Hofmann 2006](#), 105), this selectivity demonstrating the complexity of meanings which the longhouse continued to embody.

FRAMEWORKS FOR LIVING

Turning to the role of the longhouse as the architectural framework for daily life, the location of the entrance(s) is a key point for analysing household space. It is generally believed that the main door was in the narrow gable wall at the south/east end ([Coudart 1998](#), 71), implying that access to the house reflected its linear principles. However, lateral openings have been suggested on the basis of phosphate analysis ([Stäuble and Lüning 1999](#)) and recurrent patterning of finds in the flanking pits on some sites (e.g. [Hachem 2000](#), 310) ([Fig. 14.2b](#)), suggesting more flexible patterns of movement.

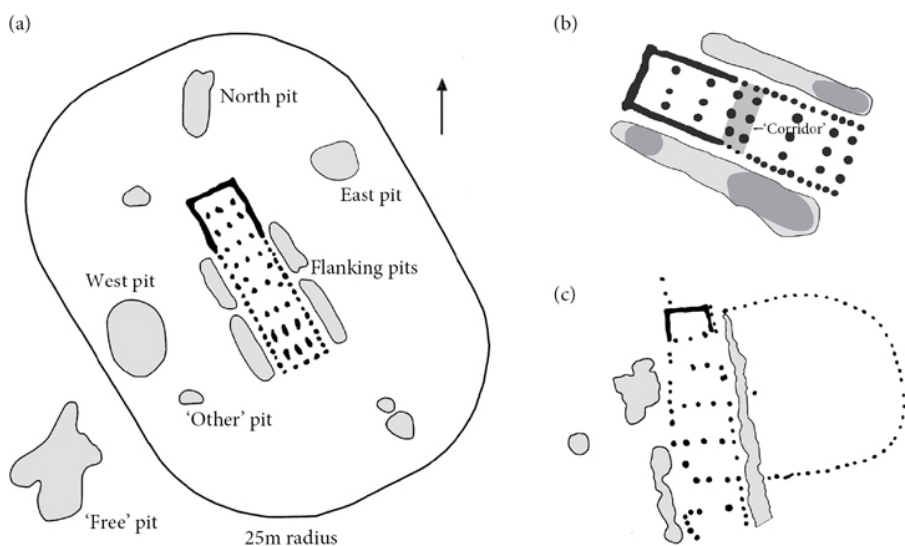


FIG. 14.2. Different models of household space in the LBK: (a) layout of pits within the *Hofplatz* in the Merzbachtal (after Boelicke 1982, 24f); (b) discard patterns in the flanking pits at Cuiry-lès-Chaudardes (after Hachem 2000, fig. 1; heavier shading marks finds concentrations); (c) fenced enclosure attached to an SBK longhouse at Atting-Rinkam

(after Riedhammer 2003, fig. 2). Not to scale.

The orthodox functional interpretation of the three parts of the LBK house also relies on circumstantial evidence. The ever-present central part is seen as the main living/working room, burnt material in post-holes sometimes suggesting a hearth at the rear (e.g. Modderman 1988, 96; Kirleis and Willerding 2008, 143). The north/west part, often enclosed with a wall-trench in later phases, is considered a secluded living/sleeping room: Coudart (1998, 105) talks about the ‘banality’ of its spatial arrangements. The south/east part, frequently with rows of doubled posts, is interpreted as a raised area for grain storage: the Merzbachtal excavations revealed more chaff near houses with this section (Lüning 2000, 158) and its disappearance in later phases at Štúrovo coincides with the presence of large storage pits (Pavúk 1994, 245–247). However, whilst the early LBK houses demonstrate the fundamental importance of the central part, their shorter southern parts might suggest different interpretations (Stäuble 2005a, 191–194). And although geochemical analyses remain rare, they have generally failed to corroborate clear functional differences between the three parts (Lienemann 1998; Stäuble and Lüning 1999). This suggests we should move away from static, unifunctional interpretations: the ‘granaries’, for instance, could perhaps be rethought in terms of a ‘versatile structure’, like the Karo rice barns of south-east Asia (Waterson 1990, 59), which serve multiple functions

without losing their sacred aspect.

MN houses often have fewer internal posts and lack a clear modular arrangement; direct clues to the functions of different parts remain sparse, though one exception is the consistent placement of hearth-pits within the Großgartach houses at Jülich-Welldorf in the Rhineland (Dohrn-Ihmig 1983). Most likely, entrances were still at the south/east end (Hampel 1989, 71), which was often widened as structures became more trapezoidal in plan, or elaborated with a porch (Fig. 14.1c); there may therefore be a greater symbolic focus on the threshold. The Lengyel houses of Slovakia diverge most from the Danubian tradition, with a bipartite division and evidence for an upper storey, again suggesting south-eastern influences (Pavúk 2003); in contrast, late Lengyel houses in the Kujavia region of Poland are trapezoidal structures in the Danubian tradition, lacking internal partitions (e.g. Grygiel and Bogucki 1997).

Understanding the domestic domain requires ‘a focus on all venues of domestic life’ (Robin 2002, 261) many of which would have lain outside the house (Pavúk 1994, 254; Whittle 2003, 141). External household space was structured by various features, most notably the flanking pits, which are usually interpreted as constructional features supplying daub for the walls and then re-used for refuse disposal (see below). By mirroring the internal structure of the buildings, they served to make the segmentation of external space comparable to that of house interiors (Bradley 2001, 52; see Fig. 14.1). Apart from these, certain features, such as pit-ovens, are more commonly found outside than inside houses (e.g. Lenneis 1995, 18), though there is much regional variation in their occurrence (Lüning 2004). Ancillary structures are rare (but see Wüstehube 1993), so activities requiring shelter must generally have taken place inside the longhouse (Lüning 2000, 157). Fences may indicate garden areas or stock enclosures, though their relationships to individual houses are often unclear (Pavúk 1994, 253f).

The most influential model for understanding the organization of household space is the concept of the *Hofplatz*, devised for the Merzbachtal settlements. This denotes a ‘farmyard’ area with a radius of 25m around the house, marked by pits in specific locations (Boelicke 1982) (Fig. 14.2a). However, its applicability elsewhere is doubtful, even for nearby sites (e.g. Bernhardt 1986; van de Velde 2007a), let alone those further afield (Pavúk 1994). Many settlements, such as Ulm-Eggingen in Baden-Württemberg (Kind 1989) or Cuiry-lès-Chaudardes in the Paris Basin (Ilett and Hachem 2001), have far fewer pits away from the longhouses than the Merzbachtal sites. Elsewhere, features were arranged differently, for example the semi-circle of pits around some houses at Brunn-Wolfholz (Lenneis et al.

1996, 102). Though it has generated plausible settlement models for the Merzbachtal, the *Hofplatz* concept can also be criticized for simplistic assumptions about the succession of houses and the fill mechanisms of pits (Claßen 2005, 118; Frirdich 2005, 94f).

In the MN, the model of extended household space—however it was organized—generally breaks down, with flanking pits less common and large communal pit complexes more in evidence. Exceptions include the early Stichbandkeramik (SBK) in Bavaria, where continuity of settlement and even individual *Hofplätze* is suggested (Herren 2003), and Villeneuve-Saint-Germain (VSG) settlements in northern France, which retain a layout akin to local late LBK sites (Bostyn 2003). A similar spatial structure reappears in the ‘household clusters’ of late Lengyel Poland (Grygiel 1986). Meanwhile, fenced enclosures directly attached to longhouses seem more common in the MN, especially the SBK (Riedhammer 2003), indicating that formal division of external household space was sometimes appropriate.

THE SOCIAL HOUSEHOLD

Whatever spatial models are developed, it is hard to make sense of how houses were occupied without some understanding of social structures. Unfortunately, inferences are difficult and even estimates of household size vary widely (Pavúk 1994, 256–258; Sommer 2001, 259). Usually households are seen as fairly small: the mass grave at Talheim has been taken to suggest the presence of nuclear families (Bentley et al. 2008), although such a group may not represent a complete household, whilst Lüning (1982) has suggested that it was only with the large Rössen longhouses that multi-family dwellings appeared.

The number of inhabitants should to some extent be reflected in the quantities of material associated with a house, along with the duration of occupation. The latter is generally not thought to exceed 25–30 years, although in principle houses could have stood much longer (Sommer 2001, 259) and there are arguments for longer lifespans in the early LBK (Lenneis and Stadler 2002, 200; Stäuble 2005a, 204f). The size of household ceramic inventories seems to vary widely, however (cf. Pavúk 1994, 174–180; Lanchon 2003; van de Velde 2007b, 120f), suggesting large differences in numbers of occupants, the use of pottery, or site formation processes (see below). Perhaps the intensity of occupation varied over the lifespan of a house: Whittle (1996, 162f; 2003, 141) has suggested that LBK longhouses were compatible with mobility in people’s lifestyles and fluidity in the composition of social groups, an idea supported by recent evidence for

transhumance (Bentley and Knipper 2005). In any case, we must confront the assumption that houses which looked the same were inhabited in the same way.

Social models of the LBK household have principally been derived from the associated ceramic assemblages, with the distribution of different motifs seen as evidence for exogamous virilocal residence patterns (e.g. van de Velde 1979; Krahn 2003). Support for virilocality has also come from isotope studies of sites in south-west Germany, with suggestions of non-local (possibly forager) women marrying into the resident group (Bentley 2007; Bentley et al. 2008; but see Bickle and Hofmann 2007). A moiety system has been suggested for settlements showing structured distributions of specific decorative motifs on pottery (van de Velde 1979; 2007b). Although affiliations of this type were rarely marked in domestic architecture or spatial organization, buildings in different parts of the site at Vaihingen-Enz in Baden-Württemberg were differently organized (Krause 1998, 15), and houses with particular features (wall trenches) may correlate with specific ceramic traits (Strien 2005, 195).

Of course, residential groups and descent groups were probably not the same, but whilst lineages might have been distributed across contemporary houses at different sites, the location of new buildings seems to reflect hereditary principles. The arrangement of successive houses at Schwanfeld and Langweiler 8, for example, shows how genealogical connections were made symbolically visible through the construction of longhouses in particular spatial relationships to their predecessors (Lüning 2005).

Danubian societies are usually seen as egalitarian (but see Jeunesse 1997), though specialized roles may have existed. At the VSG site of Poses, material culture distributions suggest houses had different functions, but no true specializations (Bostyn 2003, 212) whilst at late LBK Cuiry-lès-Chaudardes, Hachem (2000, 310f) argues for a relationship between house size and the relative importance of hunting and herding (on family 'occupations', see also Bentley et al. 2008, 301). The distinctive type 1a LBK buildings with a continuous wall trench (Modderman 1970, fig. 12) are sometimes considered to be chiefly or elite dwellings because there are usually only one or two per phase (van de Velde 2007c, 237–238), and their associated finds do not suggest a communal function (van de Velde 1979, 140f; but see Milisauskas 1986). However, the idea that bigger houses imply higher status can be criticized (Sommer 2001, 258f). It may be more productive to consider house size and form as related to ebbs and flows in household composition, or the social network a household could draw on during construction. On the other hand, type 1a houses were sometimes treated differently on abandonment: although

evidence for deliberate burning is rare in the LBK compared to south-east Europe, burnt houses of this type are known from several sites (e.g. [van de Velde 2007d](#)), suggesting a special significance.

LIFE IN THE LONGHOUSE

For [Whittle \(2003, 138f\)](#), longhouses encouraged certain ways of moving. In part, we can get at these routines through phenomenological approaches ([Hofmann 2006, 88–91](#)), but fuller understanding depends on the finds associated with each building. The surface of a Danubian settlement no doubt resembled the Maya farmsteads analysed by [Robin \(2002, fig. 2 and 257\)](#), with their palimpsests of pathways, work and refuse areas marking ‘people’s diverse and often entwined lifeways’. Unfortunately, very few LBK sites have preserved surfaces, and it has even been suggested that the houses had raised floors ([Rück 2007](#)). However, at the unusual site of Hanau-Klein-Auheim hearths were found inside and outside houses, with finds distributions suggesting activity in front of house entrances ([Sommer 2006](#)). This contrasts with the MN site of Jablines in northern France, where there is evidence for activities within and behind two buildings, but few finds from the presumed entrance areas ([Hachem 2000, 308f](#)). These scanty data at least confirm that external areas were used as intensively as the houses themselves. Similarly, in [Stäuble and Lünig’s \(1999\)](#) phosphate study of early LBK houses the highest values came from areas behind the houses.

Otherwise, we are dependent on pit assemblages for evidence of the cumulative patterns of domestic life—though as secondary refuse deposits these are hard to interpret ([Last 1995, 1998](#)). The *Hofplatz* model of household space requires various assumptions about the locations of activities and associated discard practices—but if households were small and work collaborative, refuse patterning could be independent of the *Hofplätze* ([Friedrich 2005, 94f](#)). The contents of the flanking pits therefore most likely reflect activities associated with specific houses and are usually assumed to have filled gradually during the lifetime of the adjacent longhouse ([Coudart 1998, 73](#)). However, based on stratigraphic relationships between the flanking pits and the outer trenches of early LBK houses, [Stäuble \(1997, 2005a\)](#) argues that pits may have been filled during house construction, their contents presumably deriving from middens already present in the settlement. Similarly for [Birkenhagen \(2003, 148\)](#), the low quantities of finds and homogeneous fills in many flanking pits (notably on the Merzbachtal sites) contradict assertions that they were open for the entire lifespan of a house. On the other hand, persistent patterning in

the distribution of finds within these pits at other sites, such as Cuiry-lès-Chaudardes ([Hachem 2000](#), 310) and Poses ([Bostyn 2003](#)) ([Fig. 14.2b](#)), would be unlikely to occur if pits had been backfilled. At Cuiry there was also a tendency for each household to discard faunal material on one side rather than the other, suggesting that social or cosmological aspects of longhouse architecture could have influenced discard. At Olszanica in Poland, certain types of lithic artefact were mainly on one or the other side of the house, which is tentatively interpreted as indicating male and female areas ([Milisauskas 1986](#)).

Pit contents—like other aspects of external space—therefore provide a far more varied scenario than the architecture. Even for the early LBK, [Stäuble's \(1997\)](#) interpretation may not apply at Neckenmarkt and Strögen in Austria, which showed more varied patterning in the distributions of different materials, suggesting activity zones in front (south) of the houses ([Lenneis and Lüning 2001](#)). Examples of spatial patterning of materials from later LBK sites include pottery ([Boelicke 1988](#)), lithics ([de Grooth 2003](#)), animal bone (e.g. [Marciniak 2004](#)), and charcoal ([Lüning 2000](#), 158), though in other cases it is harder to identify clear trends (e.g. [Kvetina 2007](#)). Untangling patterning in longhouse routines becomes even harder for the MN, when—with the exceptions of the early SBK and VSG cultures—flanking pits are frequently absent ([Coudart 1998](#), 52).

We also need to consider other modes of deposition beyond generalized discard. For instance, [Bostyn \(2003, 208\)](#) suggests the homogeneity of some groups of lithics at Poses reflects specific events; similarly, [Allard \(2005\)](#) has studied concentrations of knapping waste in pits at Verlaine in Belgium. Some finds from flanking pits may represent deliberately placed deposits, a comparatively under-researched area ([Hofmann 2006](#), 84–86). Examples include a complete inverted early LBK pot from Enkingen ([Reuter 1991](#)) and a deposit of grindstones from the late LBK site of Irchonwelz ([Constantin et al. 1978](#)); human burials from settlements should also be considered here (e.g. [Veit 1993](#); [Schmotz 2002](#)). In the MN, especially the SBK and Lengyel, placed deposits also occur within buildings, such as at Postoloprty in Bohemia ([Soudsky 1969](#)).

We should not, however, draw too rigid a distinction between structured deposition and 'normal' refuse. The latter would have had its own symbolic qualities and connotations, not necessarily negative ([Douny 2007](#)). For [Marciniak \(2004, 137\)](#), LBK pit-digging and filling can be seen as an intervention into the ancestral past, whilst [Hodder \(1990, 127\)](#) points out the conceptual significance of changes in the MN, when the use of communal pit complexes for refuse disposal meant that discard practice no longer marked out each house as an independent unit.

NO HOUSE IS AN ISLAND

Individual longhouses were linked, physically and socially, within wider settlements and landscapes. Settlements varied in size from ‘farmsteads’ with a single house (e.g. [Pavlů 1998](#)) to ‘villages’ with 20 or more contemporary houses (e.g. [van de Velde 2007c](#), 233) ([Fig. 14.3](#)). Site structure could influence architecture, with the standardization of house form greater at more isolated sites and in less densely populated areas ([Coudart 1998](#), 96), but in general the longhouse principles took precedence: building orientation, for instance, is the same regardless of settlement layout or topography, hindering the creation of communal space ([Zimmermann et al. 2005](#), 31). Even where open areas ([Pavúk 1994](#)) or enclosures (e.g. [Krause 1998](#)) created a concentrically ordered space, the orientation of individual houses conformed to the standard model. Only in the Lengyel culture was house orientation sometimes subordinated to settlement structure, notably at the rondels of Polgár-Csőszhalom and Svodín ([Pasztor et al. 2008](#)), again emphasizing the non-Danubian aspects of Lengyel houses.

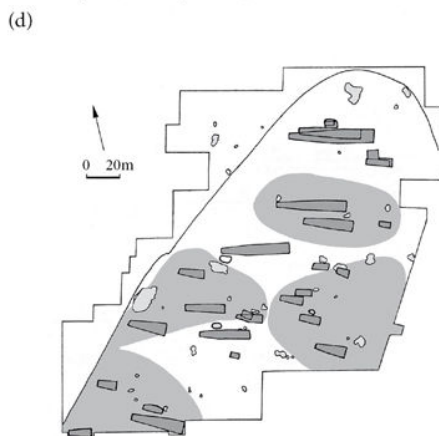
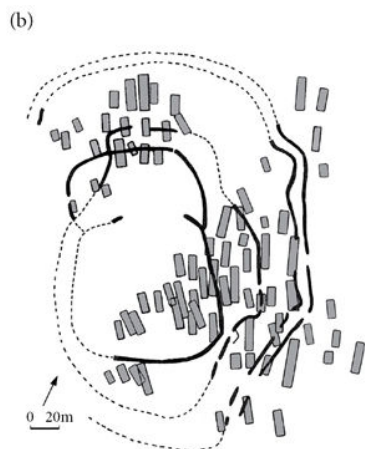
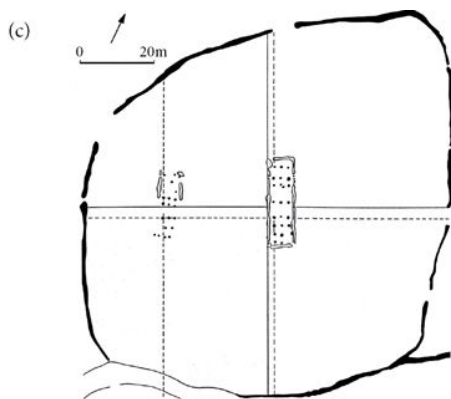
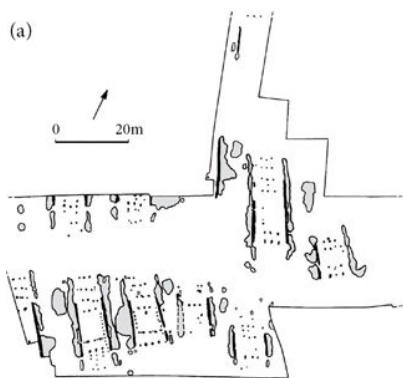


FIG. 14.3. Examples of settlement layouts: (a) rows of successive early LBK houses at Schwanfeld (after [Gronenborn 1999](#), fig. 11a); (b) houses and enclosures at Erkelenz-Kückhoven (after [Lehmann 2004](#)); (c) related geometry of selected houses and the northern enclosure at Köln-Lindenthal (after [van Berg 1989](#), fig. 4); (d) Rössen longhouses with suggested *Hofplätze* (shaded) and communal structures at Inden (after [Lüning 1982](#), fig. 12).

Although rows of houses on sites like Schwanfeld ([Lüning 2005](#)) and Cuiry-lès-Chaudardes ([Ilett and Hachem 2001](#)) seem to represent sequences of building rather than planned settlements (but see [Rück 2007](#)), there is some evidence for higher-level organization. At Geleen-Janskamperveld, two ‘wards’ divided by a central space may represent different lineage groups ([van de Velde 2007c](#), 237–238) whilst at Bylany in Bohemia small (type 3) houses were concentrated in one part of the site ([Coolen 2004](#), 79), as were the houses associated with high numbers of wild animal remains at Cuiry-lès-Chaudardes ([Ilett and Hachem 2001](#), 182). The distribution of finds and features at Landshut-Sallmannsberg in Bavaria suggests an ordered village ([Brink-Kloke 1992](#)) but the different layouts of other Bavarian sites show that the community-household dialectic played out differently even within one region.

Most sites contain pits that cannot be assigned to individual houses, whilst other communal features include wells, as at Erkelenz-Kückhoven ([Weiner 1995](#)), and groups of ovens, as at Olszanica ([Milisauskas 1986](#)). Also significant are the enclosures (see [Petrasch](#), this volume), which could reflect or establish relationships of inequality between ostensibly similar households, because they were either laid out with specific reference to particular houses ([van Berg 1989](#)) or marked out certain houses as ‘central’ or ‘peripheral’ ([Lehmann 2004](#), 295–298).

Finally, we need to acknowledge links between houses on different sites. For [Whittle \(2003, 143\)](#), LBK society was constituted by multiple identities, alliances, and exchange networks (as well as more violent interactions), whilst [Bogucki \(2003\)](#) envisages a web of kinship ties and exchange relationships between households. A key result of the Merzbachtal excavations is the evidence for differential participation of settlements in lithic exchange networks, with the relative quantities of debitage and tools at different sites suggesting only a few had direct access to flint sources and then supplied their neighbours ([Zimmermann et al. 2005](#), 30f). No doubt the uniformity of the longhouse played a role in broader cultural integration, although the nature of household social networks changed over time. For the Merzbachtal sites, [Friedrich \(1994\)](#) noted a change in settlement patterns related to the transition from Flomborn pottery to more variable late LBK styles. This is interpreted as a shift from a

homogeneous material culture, aiding the integration of people from other regions, to an emphasis on local identities, also reflected in features like enclosures. But notably, compared to the transition between early LBK and Flomborn, house form itself changed relatively little.

CONCLUSIONS

Neolithic longhouses were constructed and abandoned according to a series of architectural, social, and cosmological principles which may have been articulated discursively, but they were also inhabited and used in routinized ways which must have been understood tacitly. LBK architectural practice is remarkably uniform, but that does not necessarily mean all houses were used in the same way. Normative approaches to architecture must be tempered by an understanding that each building was differentially ‘enmeshed in a multitude of social relations’ (Hofmann 2006, 59).

Recent work on the LBK has revived discussion of social organization, but alongside the human remains we need to investigate the living body through the evidence for how people inhabited settlements and houses. What remains unchallenged is the consistent presence of the longhouse (Sommer 2001, 256). Though there were communal features to LBK life, the disposal of refuse in the flanking pits (whatever their temporality) emphasized the household as a bounded entity and the key unit of consumption. The idea that LBK homogeneity was a response to the risks of dispersed settlement, a kind of cultural *lingua franca* for building networks beyond individual settlements, is supported by evidence for multi-ethnic or ‘multi-tradition’ villages (Gronenborn 2007). But the codified building practice bringing different ideas and people together (Whittle 2003, 138) or locating and activating social memories (Jones 2007, ch. 5; Morton 2007, 177) may not be matched in other practices of inhabitation, such as the arrangement of houses within settlements, the distribution of pits, and the discard practices which reflect household routines. Some of these are structured regionally whilst others vary locally. Because conceptual principles would have been only partially activated in practice, and most people would not have known all the rules governing spatial arrangements (Waterson 1990, 73 and 100), we should not expect the same degree of consistency in daily practice as in architecture.

Whilst the MN sites briefly considered here show that longhouse culture did not end with the LBK, the observable relaxation of building ‘rules’ provided flexibility in the use of internal space, and

different trajectories appeared—from continuity in the early SBK and the VSG to the extremely large Rössen culture houses, which may reflect changes in residential groups and a melding of Danubian ideas with Balkan house concepts in the Lengyel culture. Though there are different opinions on the ‘crisis’ at the end of the LBK (Farruggia 2002; Hofmann 2006, 12f), perhaps defining local identities became more important than large-scale networks, whilst the community gradually took precedence over the individual household.

The nature of archaeological evidence means Neolithic longhouses can be reconstructed in diverse ways, often reflecting our own preconceptions (Müller 2001, 148), though no doubt the people who once inhabited them held similarly diverse understandings. By attending to the full potential of the evidence we can still trace some of the threads of those longhouse lives.

NOTE

1. This paper was first submitted in late 2009 and reflects the state of research at this time.

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CHAPTER 15

LAKESIDE DWELLINGS IN THE CIRCUM ALPINE REGION*

FRANCESCO MENOTTI

INTRODUCTION

WHAT is today known as the ‘lake-dwelling phenomenon’ in the Circumalpine region was triggered by the serendipitous discovery of a submerged prehistoric village on Lake Zurich in 1854. The question as to where and how the lake-dwellings were constructed triggered an incandescent dispute known as the *Pfahlbauprobblem* (pile-dwelling dispute), not resolved until fairly recently (Menotti 2001b). It has now been agreed that there were various types of lake settlements, and their typological distinction depended upon environmental and cultural factors.

Once the *Pfahlbauprobblem* was no longer an issue, the focus of research shifted to chronology and occupation patterns. It was then established that the lake shores were occupied for more than 3,500 years (from the late fifth millennium to the second half of the seventh century BC), but, with the advent of dendrochronology, it was soon realized that occupation was far from homogeneous—periods of occupation alternated with hiatuses which were caused by either environmental or cultural (possibly even both) factors (Menotti 2001a, 2002, 2003).

A recent development in lake-dwelling research is the study of complex systems of occupational patterns of single settlements in particular areas and within specific time spans. Special emphasis is placed upon settlement size, location, typological characteristics, and biographic aspects (Menotti 2012). Settlements are now studied from a life history perspective, from construction to abandonment, with a thorough consideration of the functions of single houses, including sacred and profane components of their inhabitants’ lives.

THE PFAHLBAUPROBLEM

The sensational discovery of the Ober-Meilen prehistoric lacustrine settlement in 1854 was promptly examined by the Swiss naturalist Ferdinand Keller, who, by the end of that year, published *Die keltischen Pfahlbauten in den Schweizerseen* (Keller 1854), a detailed report which made the Circumalpine region lake-dwellings known all over the world. Following pioneering ethnographic studies, but basing his argument on very little scientific evidence, Keller concluded that those ancient dwellings were built on large platforms in the shallow water of the lake. Over time, new lake-dwelling sites came to light, and with them different kinds of house floors, apparently built directly on the semi-dry ground. Lack of scientific evidence, however, could not confirm that they were indeed lake-dwellings, and they were simply treated as a new type of wetland construction. It was not until the 1920s, thanks to the work of Hans Reinherth, that Keller's dogma was contested. Basing his theory on new evidence from the lacustrine site of Sipplingen (Lake Constance), Reinherth (1925) argued that the lake settlements were indeed built on stilts, but they were only flooded periodically during the lakes' seasonal fluctuations.

Reinherth's theory of a semi-dry setting gained more and more credibility, but this was simply not enough for those in favour of a completely dry building ground. A decisive 'attack' was delivered by Oscar Paret in the early 1940s, when, following meticulous analyses, he provided indisputable evidence that the lake-dwellings of Hitzkirch-Seematt and Hochdorf-Baldegg (Lake Baldegg, Switzerland) were definitely built on dry ground (Paret 1942). However, Paret's theory was not unanimously accepted by all Swiss scholars. Keller-Tarnuzzer (1944, 1945) and Pinösch (1947), for instance, strongly argued that the lake villages of Breitenloo, Arbon-Bleiche, and Burgäschi/Ost were definitely erected on stilts and surrounded by water. The fierce dispute continued until the Swiss scholars Emil Vogt (1951) and Josef Speck (1955) were able to obtain new data from Egolzwil 3 and Zug-Sumpf (Switzerland) respectively, showing that the ground where the lacustrine settlements were built was definitely dry at the time of occupation. Paret's theory was eventually accepted and the 100-year jubilee of Keller's pile dwellings in 1954 was ironically and sadly celebrated by denying their existence (Guyan 1955).

Fifty years later, the 150-year jubilee was celebrated in a much more relaxed atmosphere with all scholars agreeing that all the above-mentioned theories were right (Menotti 2004) (Fig. 15.1); there is not a single type of lake-dwelling construction within the Circumalpine region but several, and each of them was used according to people's cultural needs and the surrounding environmental characteristics.

The Pfahlbauproblem

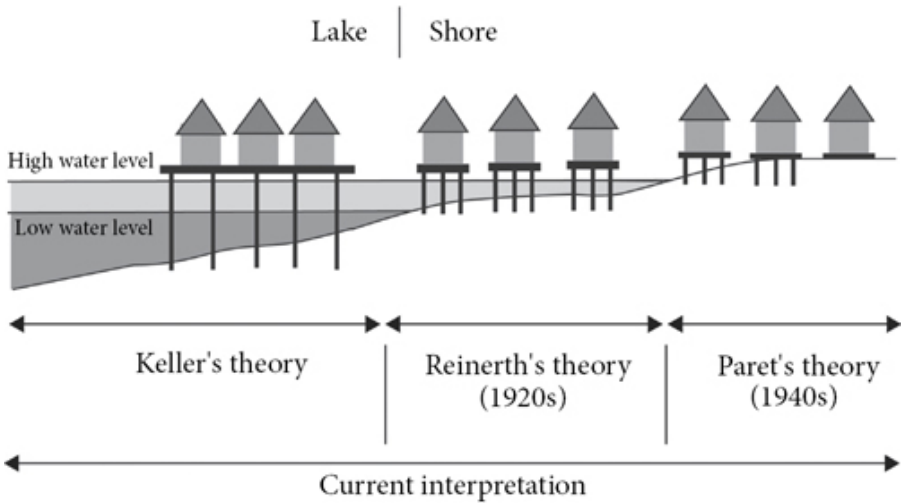


FIG. 15.1. Schematic drawing of the *Pfahlbauproblem* (the lake-dwelling dispute) (Modified from [Menotti 2001b](#)).

CHRONOLOGY: DISCONTINUITY VS. CONTINUITY

Once the lake-dwelling dispute was resolved, the focus of research shifted to chronology. The remarkably well-preserved wooden remains often found in lake-dwelling settlements have allowed archaeologists to develop reliable dendrochronological sequences, which have placed the northern Circumalpine lake-dwelling phenomenon between the end of the fifth millennium BC and the seventh century BC¹ ([Menotti 2001a, 2004](#)). However, there is also a marked discontinuity ([Suter et al. 2005, 18](#)), as periods of occupation alternated with periods of abandonment caused by either cultural or environmental factors, and, most probably, even a combination of both.

[Magny \(1995, 2004\)](#) for instance shows a plausible correlation between climate and lake-dwelling occupational patterns; periods of favourable climate coincide with periods of lake-dwelling occupation, whereas abandonment is the result of climate deterioration. At the same time though, [Pétrequin and Bailly \(2004\)](#) argue that the relationship between climate and lake shore occupation does not always work; there are in fact periods when the climatic conditions in the lacustrine environment were favourable, but the lake shores were not settled anyway (e.g. the Bell Beaker period). It is therefore vital to consider all the variables, which can be neglected in a simple environmentally deterministic research approach.

For instance, short-term climatic deteriorations in the first half of

the thirty-seventh and thirty-sixth centuries BC had little impact on lake shore occupation. The one in the thirty-fourth century BC, on the other hand, was more pronounced, but some lakes (especially in the western part of Switzerland) still continued to be occupied. Interestingly enough, during a period of favourable climate (c. 3500–3450 BC), the lake shores were mostly deserted in the whole northern Alpine region (Hafner and Suter 2000). A similar situation, but at a much larger scale, is to be found towards the end of the Neolithic and in the first part of the early Bronze Age (c.2400–1800 BC) when, apart from very sporadic examples, the lake shores were not occupied.

This characteristic discontinuity in lake-dwelling occupation has always fascinated archaeologists, who not only have attempted to bridge the above-mentioned hiatuses caused by well-defined climate change (Menotti 2003), but also tried to give plausible explanations as to why the shores failed to be settled, or were even abandoned, during favourable climatic conditions (Pétrequin et al. 2002; Arbogast et al. 2006).

A long-standing issue, which has been shed light on only recently, is what caused the final and permanent demise of the Circumalpine region lake-dwelling tradition towards the end of the late Bronze Age (see Menotti, 2015).

ECONOMY

The lake-dwellers of the Circumalpine region were a mix of agriculturalists, pastoralists, and hunter-gatherers – fishing was also an important part of their economy, especially on larger lakes.

The Neolithic lake-dwellers obtained at least 50% of their total calorie requirements from cereals, the four most important ones being naked wheat, emmer, einkorn, and barley. Of course, in terms of quantity these cereals were not used homogeneously throughout the lake-dwelling phenomenon. For instance, naked wheat was quite popular between 4000 and 3500 BC, but then lost its importance towards the end of the Neolithic, when emmer became more widely used. Einkorn was adopted to a much lesser extent and its consumption was quite steady. Finally, the use of barley fluctuated a lot (more from 4000 to 3500 BC and toward the late Bronze Age). The same can be said for poppy and flax—both popular between 3500 and 2700 BC, but decreasing towards the end of the Neolithic (Jacomet 2004). Hunting also fluctuated quite considerably throughout the Neolithic, with increments coinciding, in some cases, with climate deteriorations (Schibler 2006).

Animal husbandry was also quite irregular and cattle especially

were used in different ways in different periods. During the early phase of the late Neolithic (4300–3500 BC) for instance, their use was not economically efficient, whereas from 3500 BC onwards and until the end of the Neolithic (c. 2500 BC), the increasing development of agriculture coincided with an intensification and a more diversified exploitation of animals, with cattle husbandry more oriented towards economic profit (animal traction and dairy products) ([Ebersbach 2002](#)). Contrary to what was previously thought, fishing was very much part of the lake-dwellers' economy; diverse fishing techniques were used not only throughout the entire Alpine region, but even within single villages ([Hüster-Plogmann 1996, 2004](#)).

Finally, trade also played an important role in the economy of lacustrine groups, and it was quite developed within the Alpine region and beyond, especially concerning flints ([Affolter 2002](#)).

SETTLEMENTS

Despite being classified within a single term (lake-dwellings), the lacustrine settlements of the Circumalpine region are far from homogeneous in size, location, and typology. Small to large-sized villages were built in the shallow water of lake morainic shoals, on land near the lake shores, or even within marshy or peatbog environments, in the proximity of water basins. Their distribution in the landscape was also rather irregular and depended on a variety of factors: chronological period, geographical location, lakeshore morphology, and demography ([Menotti 2012](#)). The biographic development of lacustrine settlements (from the construction of the first house to the final abandonment of the settlement) did not follow regular and/or standardized patterns either, and it was strongly influenced by temporal and spatial factors, possibly also related to demographic fluctuations. Finally, the possibility of repairing the single habitations, as well as the availability of new potential settling land nearby, determined the duration of the settlements before their permanent abandonment.

Size

The often restricted excavation areas have prevented archaeologists from establishing the full extent of many lacustrine settlements. Nevertheless, three distinct categories, according to the number of houses found in the settlement, have been identified within the whole lake-dwelling tradition: small, medium, and large. Small-size settlements do not usually exceed eight houses; examples of such little

villages are not very numerous, but for instance include those of Seeburg on Lake Burgäschli, Switzerland, and Dullenried, Lake Feder (Federsee), Germany. Medium-size settlements have up to 20 houses; some of the best known are Sutz-Lattrigen Kleiner Station, Switzerland, Seekirch-Stockwiesen, Federsee ([Schlichtherle 1995](#)), and Pestenacker, Germany ([Schönfeld 1995](#)). Lacustrine settlements with more than 20 houses are regarded as large-size villages—they are more numerous than the previous two categories, but it has to be stressed that not all houses were fully excavated and their number has often been calculated according to small but systematically planned excavation trenches. Some of the best examples of large settlements are Sutz-Lattrigen Hauptstation (thirty-second century BC—[Hafner and Suter 2000](#)) on Lake Biel (Switzerland), the Zürich-Mozartstrasse dwelling (layer 3—the Horgen culture occupation—[Stöckli et al. 1995](#)) on lake Zurich (Switzerland), and the enormous village (more than 160 houses) of Sipplingen-Osthafen, Lake Constance, in Germany.

Settlement distribution in the landscape: the ‘*Siedlungskammern*’

How densely populated the Circum-Alpine region’s lakes were depended, as pointed out earlier, upon the chronological period of occupation. Sometimes there are only a few settlements scattered over a large area, and at other times contemporaneous villages are clustered within small territories, often sharing the same catchment area. Some of the best examples are to be found in the Zurich Bay (Lake Zurich) between the classic Cortaillod and the Horgen culture (4000–3000 BC), where three early Horgen settlements (Kleiner Hafner, Mozartstrasse, and Grosser Hafner) were settled simultaneously; or in the Auvernier Bay (Lake Neuchâtel), where as many as four lacustrine villages (La Saunerie, Les Gravières, Ruz Chatru, and Les Ténévières), scattered within a 500m radius, were occupied at the same time in the twenty-eighth century BC ([Stöckli et al. 1995](#)). Whether or not the settlements shared agricultural fields and/or woodland resources is hard to prove. What we know for sure is that the concept of *Siedlungskammern* similar to that of the Linearbandkeramik culture (LBK) ([Schade 2004](#)) cannot be identified within the Alpine region Neolithic lake-dwelling tradition (see also [Ebersbach 2013](#)).

Settlement patterns, duration, and rotation

Although clear patterns of occupation within the Neolithic lake-dwelling tradition (especially concerning the village biographic

layout) are sometimes difficult to distinguish, the so-called 'explorative' one (one or two houses constructed first, followed by a building 'boom' later) seems the most common. This occupational pattern became more and more evident from the thirty-seventh to the thirty-fourth centuries BC (Billamboz and Köninger 2008), with some of the best examples being the settlements of Sutz-Lattrigen Hauptstation (thirty-sixth century BC) and Sutz-Lattrigen Riedstation (thirty-fourth century BC), both on Lake Biel, Switzerland (Hafner and Suter 2000, 2004). This typical occupational pattern started to fade away at the beginning of the third millennium BC.

One of the currently most discussed topics within lake-dwelling research is the duration of settlements (i.e. how long they were occupied before being abandoned). Although experimental archaeology shows that a pile dwelling near, but not in, the water could have lasted about 10–15 years (Leuzinger 2004), recent dendrochronology studies argue for even shorter occupations, e.g. 5–8 years (Bleicher 2009). Duration and rotation of lacustrine settlements do not follow a regular pattern throughout the entire Circumalpine region, but vary considerably from place to place. For instance, although both regions (west and east) of Switzerland did have short-term occupations in the first part of the Pfyn culture (c. 3900–3800 BC), the lake villages in the west were occupied longer than those in the east (including Lake Constance). Curiously enough though, the already small number of long-lasting settlements in the central/eastern part of Switzerland decreased even further in the last phase of the Pfyn culture (c. 3600–3400 BC), disappearing completely on Lake Zurich. On the other hand, long-lasting villages continued to be built in the western part of the country throughout the entire Pfyn period. A quite different scenario occurred in the Lake Feder area (c. 50km north of Lake Constance), where patterns of occupation differed considerably from those in the proximity of the Alps. At the Federsee, there are, in fact, no second-generation dwellings, a site was never occupied twice (with the exception of Alleshausen-Grundwiesen), and (with the exception of Torwiesen II) the occupation of settlements seems to have been shorter than elsewhere (Bleicher 2009). Curiously, houses on Lake Feder do not seem to have undergone repairs, as opposed to those on Lake Constance, where lots of repairs were carried out even within a short period of time (see Arbon-Bleiche 3—Jacomet et al. 2004). Finally, a characteristic of the western Swiss Neolithic lake villages, which is not particularly evident in the eastern part of the country, is their synchronicity with other settlements in the same area or bay (see Sutz-Lattrigen and Auvernier—Hafner and Suter 2004).

HOUSES

As briefly mentioned above, the size and shape of the lake-dwelling house are fairly standardized throughout the entire Circumalpine region, from the Neolithic to the Bronze Age. What, on the other hand, vary considerably are the building techniques, which are adapted according to the various types of houses ([Menotti 2012](#)). Not all houses within the village had the same function; they in fact span from simple habitations to storage buildings, and even ‘cult’ houses.

Thanks to dendrochronology, archaeologists can now reconstruct the lake-dwelling house biography quite precisely, from its initial construction to its destruction/abandonment, including repairs and possible extensions. The remarkable level of preservation of some houses (and indeed entire villages) allows us to reconstruct or redefine domestic space by identifying internal spatial divisions, task- and gender-specific spaces, as well as socio-economic aspects of lacustrine communities. Recent research has not only more clearly identified different households related to different tasks within a single village community, but has even advanced the possibility that different houses may belong to a single household ([Doppler et al. 2011](#)).

Typological classification

Lake-dwelling houses of the Circumalpine region can have either elevated floors (e.g. on stilts), or be built directly on the ground. Although not necessarily constructed in the water, pile dwellings ([Fig. 15.2](#)) are probably the most common type, and they are found throughout the entire Alpine region, including the southern part ([Menotti 2001a, 2012](#)). A typical example where both house types (stilts and on the ground) were adopted in the same village is that of Fiavé, northern Italy ([Perini 1987](#)).



FIG. 15.2. Reconstruction (scale 1:1) of two Neolithic lake-dwelling houses (left: Hornstaad-Hörnle, Germany; right: Arbon-Bleiche 3, Switzerland).

(Photograph: AATG, Urs Leuzinger, www.archaeologie.tg.ch).

Houses with floors constructed directly on the humid ground (also called *Packwerkbauten*) are more common in marshland or peatbog areas, for instance at the settlements of Wauwilermoos (Switzerland), on Lake Feder (Germany), and in the Ljubljana Marsh (Slovenia). Ground-joint beams (*Schwellbauten*—see Gachnang-Niederwil, Switzerland), or simply cross-logged floors (*Schwellbalkenbauten*—see Thayngen-Weier, Switzerland) are adopted in peatbog houses, where well-insulated floors are built directly on the ground (Guyan 1967).

Habitations on stilts are, on the other hand, more common around lakes, and they are usually built by driving the piles directly into the ground (or the soft lake marl) or by securing them with perforated wooden plates (Menotti 2012, 136). Piles supporting the elevated floor and those of the house frame are often combined; in some cases, different kinds of wood are used (see Arbon-Bleiche 3, Switzerland—Jacomet et al. 2004). The block-building construction technique (in both lake and marshland areas) appears in the Neolithic, but it is not until the Bronze Age that it becomes widely used.

All the above-mentioned building techniques are found throughout the Neolithic, but they do not follow a specific diachronic chronological development, as opposed to the Bronze Age, when some

techniques are preferred at different specific times. For instance, elevated houses on stilts were favoured in the early Bronze Age, whereas the block-building technique was more common in the late Bronze Age; and it is indeed during this period that the latter construction method develops into the so-called ‘plank-pillar’ building technique (see Ürschhausen-Horn, Switzerland—[Gollnisch-Moos 1999](#)).

There are also cases where more than one construction technique was used, for instance the Neolithic lake village of Hornstaad-Hörnle, Germany ([Dieckmann et al. 2006](#)) and the Bronze Age lacustrine settlement of Greifensee-Böschen, lake Greifen, Switzerland ([Eberschweiler et al. 2007](#)).

Different buildings, different functions

Already in the 1950s it was proposed that different houses within the village might have had different functions, such as storage buildings and animal stalls. Yet it was not until recently that lake-dwelling archaeologists started to challenge this theory. Whilst a few storage buildings have been identified in some villages (e.g. Arbon-Bleiche 3, Lake Constance, and Sutz-Lattrigen Südwest, Lake Biel, Switzerland), the presence of animal stables is yet to be proven ([Ebersbach 2002](#)). What has been noticed, however, is that animals were sometimes kept within the inhabited house itself (e.g. house 1 at Pestenacker – [Schönfeld 2002](#)).

New studies on the different functions of the single buildings have recently advanced the idea that some structures within lacustrine settlements might even have been used as ‘cult’ houses. One of the best examples is the settlement of Marin (Lake Neuchâtel), where a particular building was constructed on top of an artificially made hill (within the village), situated at the end of a path over 100m long coming from outside the village ([Honegger 2001](#)).

House biography

Thanks to dendrochronology combined with experimental archaeology, it is now possible to reconstruct the biography of a lake-dwelling, from its construction to its abandonment. Although, as pointed out above, the duration of a house varies according to the location and the wood species used in the construction, it has been commonly agreed that a building in the wetlands would have lasted 10–15 years. Assuming that the house was constructed straight after felling the trees needed as building material, the presence of the

cambium (the bark ring) allows archaeologists to work out when the construction process took place and how long the building itself lasted. The presence of different cambium dendro-dates within the same building (and within the house's lifespan) is clear evidence of repairs, which were fairly common almost everywhere in the Circum-Alpine lake-dwelling tradition.

Once the house is lived in, it becomes a living entity in itself, and develops along with the people who occupy it. As a result, the building undergoes a dynamic and continuous change throughout its existence, which is reflected not only by periodical repairs, but also through transformations and extensions due to the family's demographic expansion, or economic necessities (e.g. the need for more storage, or/and working space). The presence of lake marl deposits within the site stratigraphy (indicative of lake level transgressions), as well as evidence of burning (intentional or accidental conflagration), might also tell us how and why a house was eventually abandoned ([Menotti 2012](#), 273).

The household: definition of domestic space

Notwithstanding the exceptional level of preservation, recognizing the internal division of lacustrine houses has always been rather challenging, and this is mainly due to the complex site formation processes that an archaeological site (in this case a house) undergoes, from its abandonment to its discovery. Not only are archaeologists faced with the natural distortion of the archaeological record which occurs in the post-abandonment context (especially concerning collapsed elevated house floors, where movable artefacts, as well as permanent hearths, are unrecognizably displaced from their original position—see [Dieckmann et al. 2006](#)), but also with the alteration of the site prior to being deserted (e.g. a planned abandonment, which implies a systematic removal of intentionally selected objects—[Cameron and Tonka 1993](#)). It is consequently incorrect to assume that all the artefacts found *in situ* reflect activities carried out whilst the house was still in use. A distinction between, on the one hand, depositional sets and areas, and, on the other hand, activity sets and areas is therefore needed to understand the role depositional processes played in creating the archaeological record ([Schiffer 1987](#)).

Internal division, social organization, and identity

Even when archaeological remains allow identifying the internal division of a house, investigating social organization is not an easy task. One of the most common ways is to use spatial analysis tools to

identify and define spatial cells in the material culture. A few successful cell-mapping techniques have been developed in the past three decades, with syntax and grammar methodologies being the dominant ones (Hillier and Hanson 1984). Using artefact distributions and associations (to identify particular human activities) is another long-applied methodology in spatial definition (Binford 1981; Carr 1984). Archaeologists have even applied statistical approaches, with special emphasis on Multiple Correspondence Analysis, whereby different data are analysed at the same time, producing multidimensional potential correlations between the artefacts (Brinkkemper 1993).

Addressing spatial patterning is of course important, but understanding the social meaning of a household is a different matter. One has to study the diachronic and synchronic contexts in which the habitation is found before being able to understand social meaning. According to Rapoport (1990) for instance, the built environment (setting) offers people 'cues' as to a possible behaviour, which is appropriate to a specific situation dictated by the setting itself at a particular time. There are, therefore, various and specific 'systems of activities' occurring in particular 'systems of settings'. Hence, the built environment gains or loses multiple and changeable meanings according to specific situations. It is furthermore understood that the built environment imposes schemes of social organization on people, and this organization of space reflects and generates social structure, triggering a discursive relationship between spatial organization and social structure (Bourdieu 1977). A large range of perspectives in a variety of social and material contexts has to be taken into consideration when defining the household, because habitations not only reflect social structure, but they determine it (Shanks and Tilley 1987).

There are a few important factors that have to be considered within the lake-dwelling built environment: a house location within the settlement, the layout of the settlement, and the size of the houses. It is, for instance, common to interpret architectural homogeneity as a reflection of social homogeneity. However, it has been shown that a specific village layout (rows of houses and grid layouts, for example) requires an institutionalized form of central leadership (Stöckli 1990); and the same can be said for the internal divisions of the houses. As pointed out above, due to site formation processes, finding an intact house floor that clearly shows the internal divisions of a lacustrine house on stilts is almost impossible. Yet, if the house was built directly on the ground, the floor is more likely to be preserved and internal divisions are clearly visible. In this case, the entire space is divided into two (sometimes three) little rooms, although they may only be

separated by a thin wall or divider. Whilst size and layout change, the content of the house remains fairly standardized; a permanent item that always appears though is the fireplace (sometimes we have more than one, and even vaulted ovens). The floor consists of small logs or planks, sometimes covered with a stratum of clay. Walls were either made of thin planks, horizontal logs (block-construction), or wattle, and subsequently daubed (Fig. 15.3). Because of the limited internal space of the house (c. $8 \times 4 \text{ m} = 32 \text{ m}^2$), and the failure to identify sleeping places (e.g. bedrooms), it has been assumed that the rooms were multifunctional; for instance, working spaces during the day might have become sleeping areas at night. We even have cases, especially in wetland houses built on the ground, of small animal stables included within the already limited space of the house (see Schönfeld 2002). The accentuated accumulation of organic material, such as animal bones, food remains, and coprolites, found in some areas of houses with elevated floors, suggest that the remains could have been dumped under the houses through waste trapdoors. Finally, the orientation of the house does not seem to have had a crucial importance within the Neolithic lacustrine communities, although it has been noticed that in some cases it changed drastically (90°) from one occupational phase to the other (see Sutz-Lattrigen Rütte, Lake Biel—Hafner and Suter 2004).

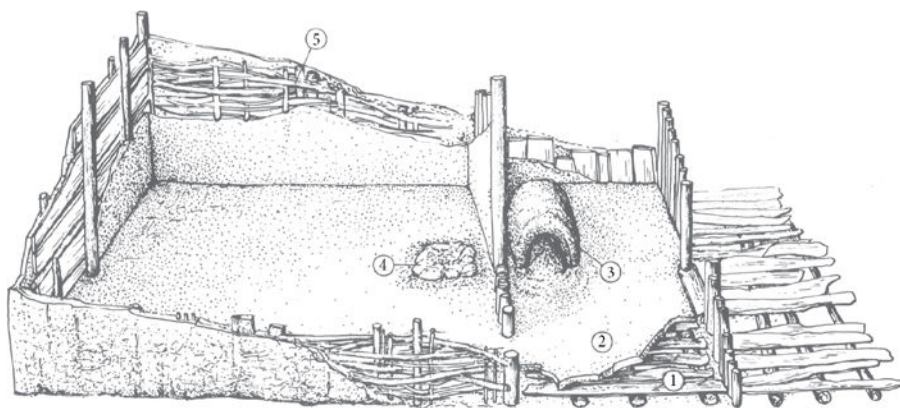


FIG. 15.3. Internal division of a wetland Neolithic house at Ehrenstein (Schussenried culture), Germany. 1) Wooden floor directly constructed on the ground; 2) Stratum of clay laid on the wooden floor; 3) Oven; 4) Fireplace; 5) Wattle wall daubed with clay (Modified from Schlichtherle and Wahlster 1986).

Task-specific spaces

Thorough artefact distribution analyses (including statistical approaches, e.g. Multiple Correspondence Analysis) carried out on well-preserved lacustrine settlements have allowed archaeologists to

distinguish task-specific areas not only within a single household, but in the entire village. One of the best examples is the Neolithic lake-dwelling of Arbon-Bleiche 3 on the Swiss shore of Lake Constance, where specific tasks seem to have been performed only in particular houses, or even in specific parts of the village. For instance, some households were more specialized in hunting activities, and others in cattle breeding. Even domestic animals seem to have had a specific division within the village, with cattle kept more in the northern part of the site and pigs in the southern part. The same can be said for fishing; fishermen in the northern part specialized in shore net-fishing, whilst the fishermen in the southern part practiced more offshore fishing from boats (Menotti 2012, 276). A division of labour was also noticed in pottery production; in fact, ceramic stylistic studies have revealed that one single person was probably in charge of pottery production for a few houses (De Capitani et al. 2002). On the other hand, stone and flint tools were more or less equally produced by each household.

The concept of community: beyond single households

Recent research has shown that houses had distinct similarities that could have grouped them together (Doppler et al. 2013). Is it therefore correct to assume that one single unit is necessarily a single household? Despite the fact that similar distributional patterns shared by some houses may be interpreted as social practice of single houses acting in an autarchic way, recent studies have advanced the possibility that the inhabitants of different houses might have been in fact related to a single household (Doppler et al. 2011).

In considering the possibility that the household goes beyond the single house and/or social unit, one has to take into consideration the whole settlement (layout, typology, location, and terrain morphology) to understand the multiple-residential household concept. As previously mentioned, the typical layout of a lacustrine or marshland Neolithic village would normally have consisted of rows of small houses clustered together and divided by narrow alleys; the remaining small areas are interpreted as 'communal space'. Although all houses could be considered as 'self-sufficient' (they all had hearths and various activity areas), a large number of daily tasks were carried out in the communal space (Fig. 15.4). However, this 'communal space' was likely to be influenced by unpredictable (or predictable, e.g. seasonal) environmental variability (flooding), which would have restricted accessibility. Therefore, the link between houses did not only depend on artefact distribution and social practices, but also on the location of the dwelling, which would have determined the

availability of ‘communal space’ throughout the year.



FIG. 15.4. Miniature model (scale 1:32) of houses and surroundings of the Arbon-Bleiche 3 Neolithic lake-dwelling settlement.

(Photograph: AATG, Daniel Steiner, www.archaeologie.tg.ch).

CONCLUSIONS

Understanding and interpreting the social complexity of the Circumalpine region Neolithic lacustrine communities is far from simple. Decoding their social complexity is a fascinating journey that starts from the settlement and its surroundings, and ends inside a single house. A ‘simple’ internal division of a small house is as important as settlement layout, size, and location within the landscape. The seemingly ‘simple’-looking material culture does not necessarily mean lack of social complexity, or an expression of unstratified society. Systematic analyses on the internal division of houses and their contents are germane for a better understanding of

the people who built them. The house is a living entity that not only reflects but determines social structure, and it is only by studying its biography that the social organization and identity of its inhabitants are fully understood. This is surely a long and time-consuming task, but, thanks to their outstanding level of preservation, it is not too presumptuous to say that the lake-dwellings of the Circumalpine region definitely have great potential!

NOTE

1. All dates quoted for the Circumalpine settlement sites in this chapter are therefore obtained by dendrochronology, unless otherwise stated.

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CHAPTER 16

THE BANDKERAMIK LONGHOUSES*

A Material, Social, and Mental Metaphor for Small-Scale Sedentary Societies

ANICK COUDART

In this chapter, Neolithic longhouses serve as a pretext for discussing social and conceptual aspects of the kind of small-scale sedentary societies represented by the first European agriculturalists. In particular, we are here concerned with the large Neolithic entity called Linear Pottery culture, ‘Linearbandkeramik’ (LBK), or ‘Bandkeramik’ (c. 5600–4900 BC), after the linear decoration on its pots, or ‘Danubian’, after its region of origin on the middle Danube (Bogaard 2004, chapters 1 & 3; Lichardus et al. 1985, 271–305, 338–55). But before discussing Bandkeramik societies and their dwellings, we must outline the role the dwelling plays at the core of each and every society: a topic that has been at the core of my own ethnographic fieldwork for over twenty years.

THE FUNCTIONS OF THE DWELLING

The house and the organization of domestic space are material in nature. That notwithstanding, they are not direct responses to the ecological constraints of their environment. In fact, the latter factors are often—in the words of Amos Rapoport (1969a, 2005)—limiting rather than enabling. Certainly, the house is meant to dominate a physical environment, but it serves above all to instantiate the rules and referents of the society that built it. It is, first and foremost, erected and used according to the social and ‘ideational’ norms underpinning the system of representations of the group that creates and uses it. As such, the dwelling shapes the social and cultural entity of its makers (in reality or symbolically) and users (nuclear or extended family, lineage, clan, allies, friends, neighbours, professional bodies, etc.).

The domestic space and the dwelling—where human beings live and move around on a daily basis—structure and reproduce the shared worldview of a society's members in the mental and the material realms, from the individual house to the society as a whole. The components of the dwelling separate and articulate private and public spheres, masculine and feminine, self and other, the places to rest and to receive guests, nuclear and extended family, pure and impure, dry and humid, high and low, etc. (see [Bourdieu 1970, 1979](#)).

Of course it is because they are material and exist in space that dwellings, families, and lineages are socially and culturally sustainable. Anchored in a territory, the dwelling presents a social group which—over time and across generations—sees and recognizes itself as belonging there. Moreover, when associated with a particular way of dividing the world (a *sequentia*), the topological and geometrical relations—which create a mental map and represent the space inhabited—are conceptually immutable (as we see in the work of cognitive scientists, ethologists, technologists, or specialists in traditional architecture). This 'spatialization' is one of the foundations of the 'persistence' of human cultures.

Hence, it is my point of departure that a society finds it difficult to change the way it inhabits its dwellings without fundamentally questioning the foundations of its identity and existence. Contrary to objects, architectural techniques and the *chaîne opératoire* of house construction are normally neither copied nor exchanged between different societies (see, for instance, [Rapoport 1969a](#)).

Because the house is both a whole (a social and cultural entity) and a distinct instantiation of that whole (a specific dwelling inhabited by specific individuals), it also carries and produces 'individual' meaning. Domestic architecture can therefore lend itself to many variations whilst the conceptual partition of space—as it is lived from day to day—remains immutable. Moreover, a dwelling—a composite object if there is one—combines many technical cartographies.¹ That heterogeneity is the reason that individual dwellings may incorporate certain elements from other cultures and are subject to the contingencies of history—but only if these do not upset the underlying spatial structure.

THE HOMOGENEITY OF THE BANDKERAMIK LONGHOUSES

Despite regional variations in material culture, the homogeneity of Bandkeramik architecture in central and western Europe bespeaks an astonishing and exceptional cultural unity across a very large territory

(more than 1,500km from east to west, between the Vistula and the Paris Basin) and over a long period (from the second half of the sixth to the first half of the fifth millennium). Raising cattle, ovicaprines, and pigs, and cultivating cereals as well as hunting and gathering, the Bandkeramik peoples were the first sedentary populations in temperate Europe. A widespread and sustainable ‘culture’: the first, and, maybe the last, observable instance of European identity.

More than 2,000 ground plans of Bandkeramik dwellings have been revealed.² Their characteristics are well-known, all the more so because they conform to a model³ that is universally shared among their builders and users. The Bandkeramik ‘standard’ did not emerge instantly—but neither did Gothic or Romano-Byzantine architecture. It co-evolved with the development of Bandkeramik culture. It is therefore normal that we do not find all its constituent elements in plans of the oldest dwellings. First, the house is long and quadrangular (Figs 16.1 and 16.2). At ground level its plan is a rectangle or an isosceles trapezium of which the longest of the short sides is the house’s façade (a third type combines characteristics of the first two: rectangular in front and ‘trapeziform’ at the back⁴); that façade faces the region of origin of the Bandkeramik culture, the middle Danube (Mattheusser 1991). Small ceramic house models dating especially to the somewhat later fifth millennium BC Lengyel group give an idea of the superstructure of the buildings, with a roof sloping off towards the long sides. Second, the length ranges widely from 10 to 45 metres. Comparatively speaking, the width of the houses varies less, generally between 5 and 7 metres (with some extreme cases between 3.6 and 8 metres), probably due to the absence of transverse links such as a roof truss system. Third, the moulds of the posts (that constituted the framework of the houses) are aligned in successive transverse rows of three along the length of the building, together forming three lengthwise parallel lines (Fig. 16.2). Everything points to these being the supports of lengthwise architectonic links, such as are still observable now in Indonesian ‘longhouses’ or the quadrangular dwellings in the Papua New Guinea highlands. Fourth, once the standard of the internal space was well established, the spatial units (i.e. the span between two rows of three posts) organize the interior space in a way very particular to Bandkeramik architecture, and which may be summarized in the following sequence: ‘1x – 2x – 3x’ (see Fig. 16.2.1e). This configuration is not due to a physical constraint, but rather responds to the population’s mental representation of a house. The number of rows of three posts is, for example, much greater than physically needed to support the roof. The shorter the house, the higher the number of post rows relative to its length and hence the shorter the span between two rows. Inversely,

the longer the house, the greater the span between rows. The length of each span was therefore not imposed by the techniques used. Rather, it seems as if a certain number of spans was ‘mentally’ necessary for the building to resemble a Bandkeramik house. Finally, the pits alongside the houses (interpreted as construction pits, from which the clay covering the walls was extracted) contain waste materials that, in the absence of the original palaeosol, allow us to reconstruct the inhabitants’ activities and the foods they ate, and also to date the houses and tie them into one of the groups constituting the Danubian culture.

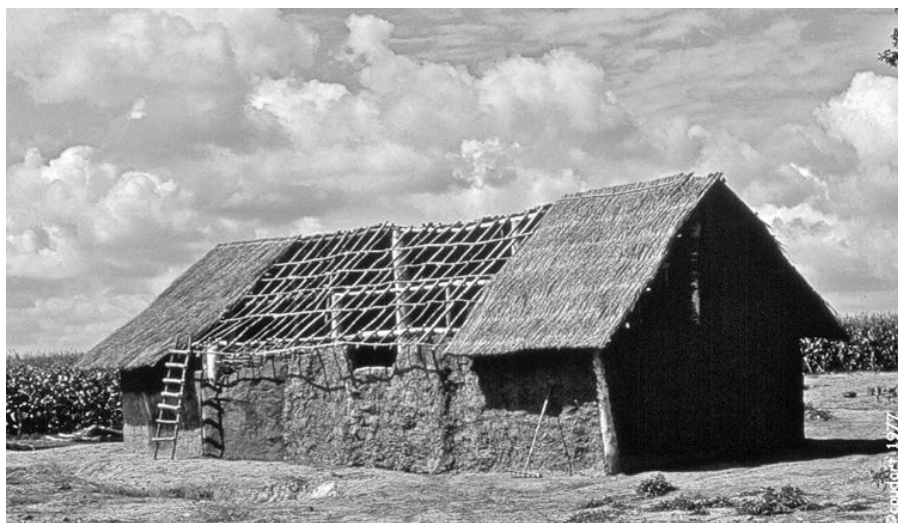


FIG. 16.1. Reconstruction of a Linearbandkeramik house, Cuiry-lès-Chaudardes, Paris Basin, France.

(© Coudart, CNRS).

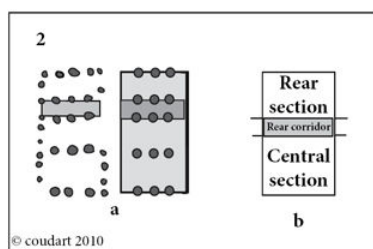
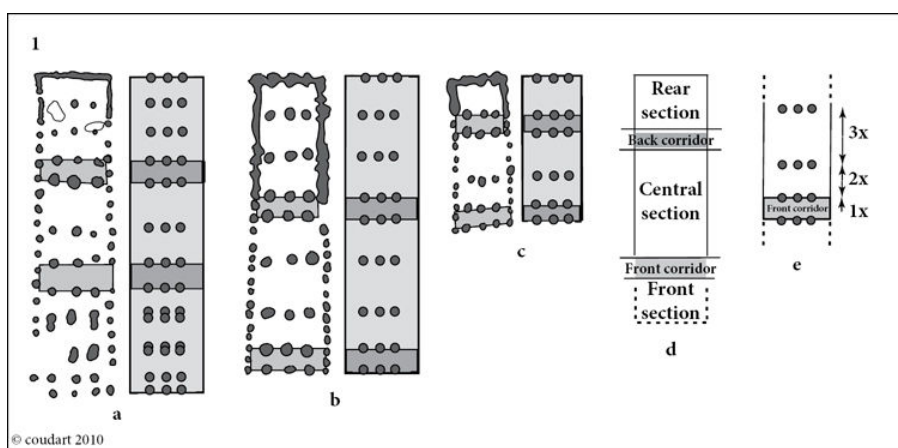


FIG. 16.2. 1—Tripartite Linearbandkeramik house (96% of cases); 1a) House 32 at Miskovice, Bohemia, Czech Republic; 1b) House 245 at Cuiry-lès-Chaudardes, Paris Basin, France; 1c) House 57 at Elsloo, Limburg, The Netherlands; 1d) The pattern of the tripartite Linearbandkeramik house; 1e) The most common pattern (81%) of spatial organization in the central section of the Bandkeramik house. **2**—Bipartite house (4.5% of cases); 2a) House 425 at Cuiry-lès-Chaudardes, Paris Basin, France; 2b) The pattern of the bipartite Linearbandkeramik house.

The markers identifying the buildings as Bandkeramik are particularly evident at the level of the transverse passages (a narrow corridor constituted by two rows of three posts) marking the division between the front and central part of the building, and between the middle and rear (Fig. 16.2.1). These occur in 94% of all buildings—and across all periods. This tripartite division into a front, middle, and rear part is also characteristic of the Bandkeramik house. In some cases (4.5%), the front corridor is absent; then the house is simply bipartite.

Interestingly, notwithstanding the normalization of the buildings' components, some of them were allowed to vary between several options, such as the exterior spatial organization (shape and location of construction pits, drainage trenches), or the shape of the ground plan, the layout of the external walls, etc. But above all, there are

options for each of the three subdivisions of the building: six, seven, and six respectively (Fig. 16.3). These options were not endless, nor random, but ‘culturally’ well-defined: they recur in all periods and across the different regions.

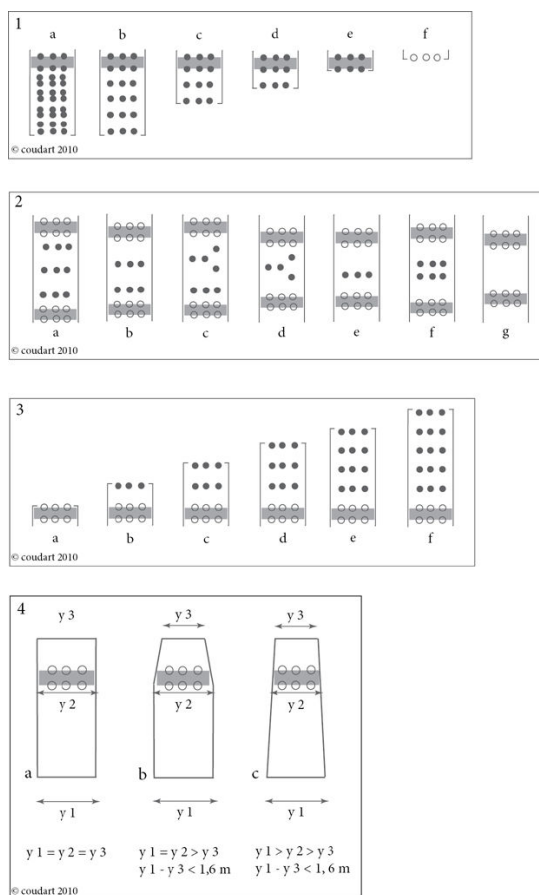


FIG. 16.3. 1—Options for the front section: a & b are storage platforms; f corresponds to the absence of a front section. 2—Options for the central section. 3—Options for the rear section. 4—Options for the ground plan: a) rectangle; b) rectangle (front and central sections) combined with a trapezium (rear section); c) trapezium.

From this follow three questions we may ask of the Bandkeramik dwelling: why are all the options used in some villages,⁵ whereas in others only two or three are found? To what extent are these options used relative to the lifetime of a village? Why do one or two of these options sometimes dominate all others?

THE FRONT SECTION OF THE HOUSE ANNOUNCES

CERTAIN SPECIFIC FUNCTIONS

Ethnography teaches us that the front part of the dwelling (which may include the space outside, immediately in front of the house) is never neutral. It is the transition between the interior and exterior, and signals the household's function, status, and identity (e.g. [Chapman 1955](#); [Duncan 1982](#); [Oliver 1987](#); [Preston-Blier 1987](#); [Rapoport 1969a](#)).

Where a relative chronology between the houses of a single village could be established, the 'corridor' ([Fig. 16.3.1.e](#)) and the 'antechamber', a spatial unit ahead of the front corridor ([Fig. 16.3.1.d](#)), are the two most frequent types of front end. However, because the posts in the front part are often doubled to support an elevated internal platform as well as the roof ([Fig. 16.3.1.a](#)), houses with such 'storage platforms' are archaeologically easier to spot and have therefore been identified more frequently (biasing our statistics).

In each village, the front part of the house is very variable,⁶ whatever the period or region, almost as if the use of several types of front end was always necessary. A quantitative diversity corresponds with this qualitative one: each front end type is related to a particular class of length. Hence, a different surface was probably needed for different functions or activities, and each of these functions or activities was shared by several households, as each type of front section existed in several buildings in each village (except the storage platform).

The storage platform seems to have existed only in one or two contemporaneous buildings in each village—whenever, that is, we are able to establish a relative building chronology. The households that lived in houses with such platforms were most likely in charge of cereal storage (and redistribution). Platforms are also associated with a larger quantity of husks and straw ([Bakels 1978](#)), whilst the proportion of grindstones and de-husked grain per inhabitant did not differ much between buildings (cf. [Hamon 2006](#) on the use of grindstones). In other words: whereas cereal storage and management was the business of one or two specific households, consumption was more or less egalitarian. Moreover, locating the grain storage area in the front part of the building, where it was visible to all, probably reflects a degree of accountability of that household to the community as a whole.

THE CENTRAL SECTION: DOMESTIC ACTIVITY AND VISITORS

Generally separated from the exterior world by a corridor, and sometimes directly accessible from it (when there is no front part), the central part of the Bandkeramik house seems to have been the place for daily activities and for the reception of visitors.

The spatial organization of this section was the most variable, with particularities such as the alignment of a row of three posts as an inverse 'J', rather than a rectilinear pattern, or an arrangement of four posts into a 'Y'-shape (Fig. 16.3.2.c and d); almost as if to present a certain message to any visitors. Moreover, the different kinds of spatial organization were not linked to surface area, which could vary between 9 and 27m² for the same type of spatial organization (which is not the case for the front and rear parts).

Finally, in isolated or short-lived villages, the central part was the same for all houses. The rate of variation in the organization of the central section is also low in the margins of the Danubian territory, but high in the dense networks of settlements in central Europe at the time of the greatest expansion of the LBK. This indicates that the existence of a well-developed exchange network (of goods, people, and skills) and a good knowledge of the environment in the zones that were first colonized were compatible with the expression of differences between households. Inversely, isolation and incomplete exploration incited the members of a community to reinforce the similarities between them. This is a phenomenon also encountered in the architecture of the ancient colonial cities of classical Greece, in which the marginal population was strongly dominated by Greek ideology and the 'democratic' ideal, and thought of itself as such to the maximum extent possible.

THE REAR SECTION: THE LOCUS OF THE GREATEST PRIVACY

The rear section is situated at the end of the building, separated from the central section by a second corridor. It is the most withdrawn and the least accessible to visitors. The simplicity of its spatial organization (a regular succession of spatial units) seems, indeed, not to convey any message to potential visitors. The number of units seems directly related to the size of this section, as if the organization was more 'quantitative' (related to the number of people in the household) than qualitative. This was probably the most private part of the dwelling—it was not necessary to express any specificity because only the household and close friends had access to it. The longer the village was occupied, the more the number of spatial units in the rear section varied between buildings, as if with time the size of

domestic groups became more varied.

A RISKY WORLD: THE CONTEXT OF BANDKERAMIK SOCIAL RELATIONS

Bandkeramik populations existed in a 'risky' context; there were no permanent threats to their existence, but the accumulation of several disequilibria risked causing a 'tipping point' at which the usual solutions to challenges were no longer effective and traditional practices inappropriate. What may these risks have been?

First of all, the Bandkeramik people were the first farmers to colonize this part of Europe, at the time covered by a primary forest with seasonal food production. Its dense canopy limited the plant cover of the lower, food-producing levels accessible to humans. Moreover, there was competition from insects and other mammals (Clarke 1976, 1978; Gregg 1988).

The territory was poorly explored, except by small groups of Mesolithic hunter-gatherers exploiting very different ecological niches. Social alliances did exist, as is evident from certain stone tools, but their limited potential did not contribute to solving the difficulties the Bandkeramik colonists must have encountered.

Then, the means of production were limited and the soil quickly exhausted, at least where it rained frequently and where there was no calcareous subsoil (Langohr 1990). The absence of the plough favoured the development of weeds to the detriment of crops; the absence of fertilizer (except burning) accentuated the irregularity of yields which were difficult to predict anyway, and could often fall below the necessary minima.⁷ The small proportion of domesticated pigs also implies that food production was limited, because humans and pigs are partly in competition for the same foods.

Finally, the residential units were small, comprising on average between five and eight contemporaneous households—which drastically limited their potential to survive.

ON THE IMPORTANCE OF EGALITARIAN STRUCTURE

In this kind of 'risky' situation, the differences in perception, appreciation, and creativity between individuals (or groups of individuals: nuclear or extended families, lineages, clans, etc.) guarantee to some extent their adaptive potential and success. Utilizing all the knowledge and capabilities of the group may allow the latter to adapt and to rapidly find solutions to the challenges

posed by the contingencies of history and climate.

An egalitarian social structure—which brings into play everyone’s adaptive potential—clearly improved the Bandkeramik populations’ chances of success beyond what these would have been if knowledge and capabilities were hierarchically organized.

THE SOCIAL EQUALITY OF BANDKERAMIK POPULATIONS

It appears that each of the individual domestic units of a Bandkeramik village possessed more or less all available technical know-how. The relative, yet extraordinary, uniformity of architecture and discarded material culture, and the similar amounts of meat eaten by each household (Hachem 2000; Bedault and Hachem 2008), show the absence of prestige goods and above all of wealth products: only a few elements of personal adornment and some adze fragments qualify (Bakels 1987, 80; Bonnardin 2004; Allard 2005). Everything points to a structural equilibrium and equivalence between the elementary socioeconomic units.⁸ In other words, equality of expression reflects equality in terms of decision-making and production, and a social structure in which no social rule is incompatible with access of all socioeconomic units to resources and sources of information. This does, however, not imply equality in the narrow sense, as if every individual would have completed the same tasks, benefited from the same status, and assumed the same responsibilities. Such an identity of individual roles and treatment is not observed archaeologically.

For one of the best preserved and most studied sites, Cuiry-lès-Chaudardes, France, it has been possible to estimate the population of a village on the basis of the length of the buildings and the number of spatial units in their rear sections. This allows us to suggest a number—which certainly varied through time—of between 80 and 250 people living in contemporaneous households. This is amply sufficient to carry out all the farming tasks, but a true handicap if the equality among them was as narrow as we have just discussed.

For every event requiring a consensual decision, the increase in the number of information sources exponentially multiplies the number of necessary interactions. Only about 15 exchanges are needed for six participants to share their information, but 66 exchanges are needed if the number of participants grows to 12 (that is, when it is doubled). This increases the potential number of disagreements and the time necessary for each collective decision. Equality would, under those circumstances, have been a source of obstacles, and could have had catastrophic consequences in times of crisis.

Thus, to be operational, an egalitarian group must be ‘horizontally

hierarchized' (Johnson 1982). Each social unit (composed of several individuals, nuclear families, or lineages) participates on an egalitarian basis in maintaining and reproducing society, in the full respect of the entity that it constitutes. If we assume equivalence at a more inclusive level (between households, lineages, or clans, for example), then the number of Bandkeramik social units per cluster (between five and eight per settlement) offered an acceptable upper limit to the number of communications involved in decision-making. We envisage, therefore, an egalitarian structure combining the minimum number of actors necessary for farming with an upper limit to the number of potential conflicts.

Thus, the activities of egalitarian societies are diversified, as seen in the New Guinean Baruya (Godelier 1982, 1986) and Ankave (Lemonnier 1991) tribes, or in the American Southwest among the Hopi (Connelly 1979) and Zuni (Watts 1997). Among the Bandkeramik populations some people managed cereal storage, and the manufacture of grindstones may have been the task of specialists, whilst their use was accessible to all (Hamon 2006). Roles, status, rights, and obligations were not necessarily the same for every individual or household (e.g., some consumed more big game or domesticated animals than others, but all had access to them). Real distinctions existed according to sex, age group, etc. and above all when exercising certain special tasks or responsibilities (e.g. deciding the beginning of the sowing season, as in the case of the Hopi; see Talayesva 1942). Behind such temporal and sequential activities, one could envisage the 'Great Men' of Maurice Godelier (1982, 1986, 1991) or the 'leaders' of Pierre Lemonnier (1991).⁹

However that may be, the individual's political power is, in this context, exercised for the benefit of all, and under the control of all. It is a kind of delegated power, because the group uses the specialist, Great Man, or leader; the group benefits from his talents, rather than being exploited for his own interest. Recognition of a special role may lead the group to treat a Great Man or specialist in some respects differently to the remainder of the community. This could explain the existence of specific Bandkeramik buildings—either very long ones (between 35 and 43 metres), or ones of the usual length (between 21 and 35 metres), but with walls inserted in foundation trenches; in all other respects, these houses conform perfectly to the shared model (see also Last 2013; this volume). The associated refuse does not indicate that these were connected to any kind of durable political power.

Equality is thus simultaneously a product of society, an analytical convention, and an anthropological concept, and in no way excludes the occurrence of the individual variations and differences in status

that every 'egalitarian' society needs to reproduce itself. Looking at Bandkeramik houses, their inhabitants' egalitarian social structure did not exclude variations and differences, but integrated them. These differences nevertheless constituted the seeds for the true inequalities and specialization of later periods.

WHY AND HOW DID THE EGALITARIAN PRINCIPLE PERSIST SO LONG IN THE HISTORY OF HUMANITY?

The fact that human societies have initially and for a long time functioned according to principles of equilibrium and equivalence does not automatically imply the 'natural' priority of the egalitarian principle over that of social stratification: equality is not at all 'natural'. It is a *social* rule, and can only be implemented socially. If egalitarian societies characterize the long beginning of modern humankind, it is because—given their demographic conditions and context of production—only an egalitarian structure allowed them to be consistently successful enough to leave archaeologically visible traces: basically a kind of 'social selection'.

Individual differences are inherent in human behaviour and the normal state of societies is to change, rather than to maintain themselves. We should therefore ask why and how the principle of equality persisted and recurred, rather than why and how hierarchies and social inequalities emerged.

For the Neolithic, two essential questions pose themselves:

1. Which social rules, collective representations, and cultural norms contained and limited these differences for so long in favour of equivalence and equality?
2. Which dynamics led egalitarian social systems to nevertheless accord their elementary units and individuals a sufficient freedom of action to ensure that their adaptability, inherent in the diversity of human beings, allowed societies to change, and not only to maintain themselves (and hence disappear)?

THE ROLE OF THE BANDKERAMIK HOUSE IN REPRODUCING AND TRANSFORMING EGALITARIAN SOCIAL STRUCTURE

The necessarily collective construction of the Bandkeramik longhouse was, through its extreme standardization, a privileged (although probably not the only) occasion to reaffirm—through and for each participant—the collective identity and structuration of Bandkeramik

society. By building their dwellings according to strict norms for many centuries (construction almost becoming a quasi-ritual), households—probably helped by kin and allies—reaffirmed that they belonged to their society, whilst simultaneously reproducing the egalitarian principle of that society. Reciprocally, the rules and norms re-imposed the egalitarian principle upon builders and households by immersing them in that egalitarian structure.

But how do we appreciate—in the light of this multi-secular normalization—the process that ultimately transformed the egalitarian social structure of Bandkeramik populations?

If the virtually ritualized construction and the everyday use of the house were essential instruments in the almost identical reproduction of Bandkeramik society, the inherent variations in the architectural system offered the possibility to act upon that system from within. The dynamics of reproduction and transformation should analytically appear in the relationships between the uniformity of certain components and the different degrees of variation of the other elements of the house. Bringing these relationships to light necessitated the archaeological ‘deconstruction’ of the building into its observable elements and the classification of them according to the number of alternative options that occur (in other words, the extent of variation).

The architectural elements of Bandkeramik dwellings may be divided into three categories of variation, which leaves a range of more or less individual elements that do not seem tied to collective norms.

1. The first category (uniformity) includes seven elements with only one available option: the ground plan is quadrangular; the building long and oriented towards the middle Danube; the entrance opposite the rear wall; there always is a physically unnecessary superabundance of posts; interior posts are grouped in rows of three; walls are not load-bearing.
2. The second category (limited variation) includes six elements that are not uniform, but occur in only two or three variants, one often heavily dominating the others: the form of the ground plan (strictly rectangular, slightly trapeziform, or rectangular between the façade and the rear corridor, and then slightly trapeziform); the partition of interior space (two or three sections); the ways to separate sections of the house (a corridor or a row of three deeply set posts); the façade (with or without antas, open porch-like structures); wall construction in the rear of the house (discontinuous uprights, foundation trenches, paired uprights); the presence or absence of a child burial.
3. The third category (strong variation) includes six architectural traits which occur in diverse, but narrowly defined, forms allowing between four and seven options, such as the organization of the front and central sections; the number of units in the rear section; the spacing of the rows of three posts in

the central unit; the arrangement of the long walls; the external space (see Fig. 16.3).

4. Finally, the fourth set comprises a small number of elements that do not fit any cultural norms: the number of posts; the length of the house; and the relationship between form and length of the central part of the house.

To better understand the chronological transformations of the Bandkeramik house, we must also include the dwellings of the Danubian groups that continued the Bandkeramik tradition but allowed distinguishable regional groups to emerge (Lengyel, Hinkelstein/Grossgartach/Rössen, Stichbandkeramik, and Villeneuve-Saint-Germain/Blicquy) to inventory the architectural elements found, those not found, or those found under a different guise.

Our hypothesis is that the more alternative forms are available for a specific architectural element (i.e. the more variation there is between individual houses), the earlier and the more rapidly that element will be transformed, or disappear altogether. In contrast, the fewer the options, the longer the element persists.

Indeed, the architectural components in the third and most variable category changed first: as early as the middle Bandkeramik for certain types of front section, before the final Bandkeramik for construction pits and drainage trenches, and at the beginning of the post-Bandkeramik for interior spatial units. The transformation of elements in the second category began later, with the post-Bandkeramik groups (new forms of ground plan, new types and architectonic functions of the walls, new ways for internal separation). The most uniform architectural traits of the Bandkeramik house were maintained until the end of the Danubian tradition (including the post-Bandkeramik groups), except for those concerned with the most material functions of the house (e.g. the system of joints and the physical function of the walls). Until the very end, post-Bandkeramik Danubian buildings were—like the image of the original house—quadrangular, long, and oriented towards the middle Danube, and several rows of three posts marked the interior space.

In addition, over the same length of time, the changes affecting the most variable architectural components (the third category of variation) were more numerous and, thus, of shorter duration than the components of the second category of variation. This hypothesis can be extended to every architectural tradition: the more uniform (single-option) or only slightly variable (two or three options) elements a traditional dwelling possesses, the more durable that tradition is (see below). On the other hand, the more very variable elements (six or seven options) a house has, the easier it can be conceptually transformed, or can integrate elements from other traditions.

The relations between our different categories of variation (not

forgetting the components that do not fit any cultural norms) can be translated into a curve combining four points, each representing a different category of variation (Fig. 16.4). The resulting abstract ‘structuration’ graphically translates what constituted the traditional Bandkeramik longhouse, and this abstraction allows us to compare several traditions. With respect to the chronology of architectural transformations, the higher the left-hand part of the curve (representing the uniform and only slightly variable components) relative to the right-hand part (the highly variable and individual components), the more persistent the conception of the buildings is.

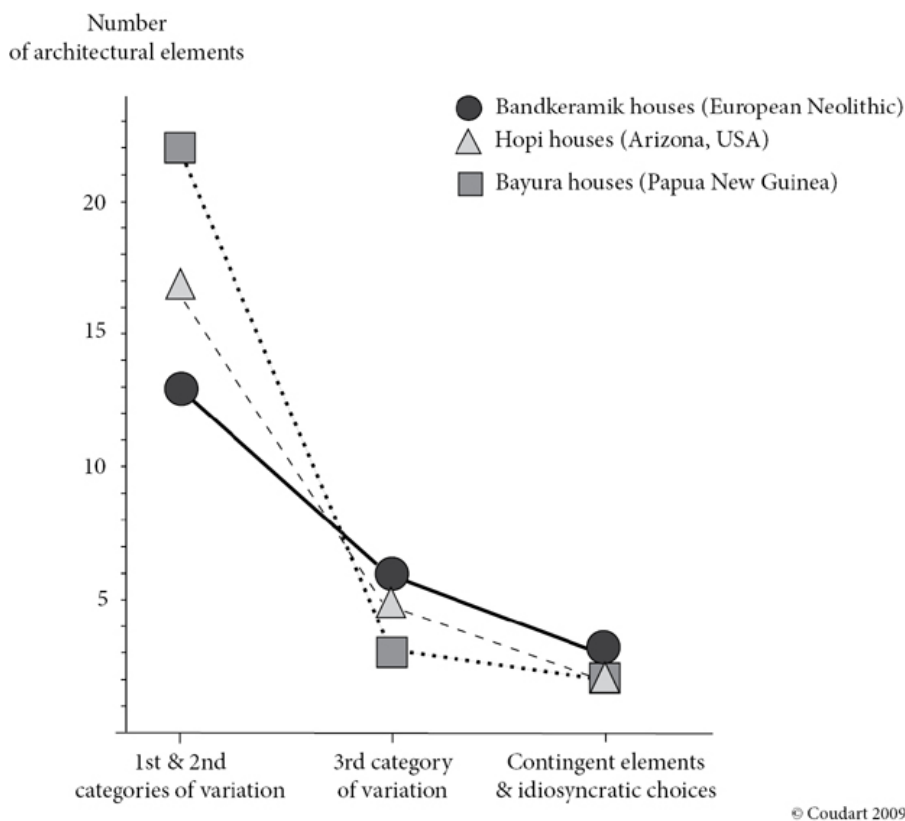


FIG. 16.4. The abstract structuration of the Bandkeramik longhouse tradition given by the relationship between the different levels of variation of the culturally defined elements of the house and its contingent elements, or idiosyncratic differences—this structuration allows conceptual comparisons with other architectural traditions (for instance the New Guinean Baruya and North American Hopi dwellings).

Finally, in the context of the social and conceptual ‘functions’ of a dwelling evoked at the beginning of this paper (i.e. that the house implements the rules and references of a society), we may affirm that

the more 'very variable' components an architectural tradition has, the more easily the culture to which it belongs can transform itself. Inversely, the more 'uniform' components there are, the longer the principles and rules that ground the society may last. This hypothesis has been confirmed by several studies undertaken in Papua New Guinea (Coudart 1994a, 1994b) and by observations among the Hopi and Navaho in the south-west of the United States (Rapoport (1969b)).

NOTES

1. A dwelling combines numerous conceptualizations of spatial organization (cartographies or topologies) and time (sequences of construction and of use). For instance, 'up' and 'down' can lead to two cartographies and related construction sequences: the roof can be built from the top to the bottom (cartography 1), the walls from the bottom to the top (cartography 2). The same is true with the conceptual oppositions 'inside/outside' or 'close/open': using a door (from the outside to go in or vice versa) implies, at least, two different cartographies; etc.
2. The percentages given below are based on a very detailed study of 349 well preserved LBK and 75 well preserved post-LBK Danubian dwellings from 76 sites (Coudart 1998).
3. The notion of 'model' is here understood as a mental representation of a set of traits and components constituting a coherent architectural system; it therefore differs from the 'model' as traditionally understood by architects.
4. The term 'trapeziform' seems more appropriate for this kind of ground-plan than 'trapezoidal' (a geological term indicating a volume of which all sides form a trapezium), generally used by archaeologists.
5. The term 'village' is here used independently of the significance it has been accorded by medieval historians or modern urbanists; it designates simply a grouping of dwellings (contemporaneous or not) in the same location.
6. The variation index V of an architectural component is calculated for each chronological phase of a village. Three elements are taken into account: a) the number of types present for the component concerned; b) the percentage of houses with the most commonly used type; and c) the percentage of houses with other types of variation. The calculation consists of adding a and c , whilst keeping c equal to $100-b$, and therefore involves the following procedure: $a + (100-b)$. In order to avoid reducing the small number of types—between three (e.g. for the possible forms of the ground plan) and six (e.g. for the kinds of rear section)—with respect to the percentage, the number $(100-b)$ is multiplied by 0.1. For each architectural component, the index of variation V is therefore calculated as follows: $V = a + [(100-b)/10]$.
7. This irregularity of the yields, and the fact that productivity could fall below the minimum threshold needed for several successive years, persisted until the nineteenth century (see Tits-Dieuaide 1978).
8. We are here looking at segments of society and not at individuals.
9. Based on the study of the highland New Guinean Baruya, Maurice Godelier (1982, 1986, 1991) elaborated a *theoretical* evolutionary continuum of social transformations with—at its two extremes—'Great Men' societies (defined

from the relatively egalitarian Baruya society where Godelier arrived 16 years after their 'first contact') and 'Big Men' societies (as defined by [Marshall Sahlins 1963](#)). 'Great Man' organization is based on exchanges of identical things in similar quantities; moreover, its kinship system does not require the accumulation of wealth to obtain a wife. Great Men are not 'chiefs' (*pace* [Spriggs 2008](#)), but temporary leaders: they act for the benefit of the group as a whole, and competition through gift exchange is not transformed into social power or authority over others. In contrast, the Big Man system—whether the product of colonial (in Spriggs' opinion) or pre-colonial organization—rests upon quantitative and qualitative nonequivalence; moreover Big Men are rich and play a dominant part in competitive exchanges, basing their power on their capacity to redistribute wealth at the right moment. For Big Men to exist, the situation must favour competitive exchange and wealth accumulation. Notwithstanding the presence of a storage area in certain Bandkeramik dwellings, which are much longer than the others, the complete conformity of all houses to a European architectural model and, above all, the very limited quantity of prestige goods and very limited agricultural production, seem incompatible with the existence of Bandkeramik Big Men ([Coudart 1991](#)).

10. See Rapoport, A. 1969b. The pueblo and the Hogan. A cross cultural comparison to two responses to an environment. In P. Oliver (ed.), *Shelter and society* 1, 66–79. London: Barrie and Jenkins Ltd.

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CHAPTER 17

HOUSES, HALLS, AND OCCUPATION IN BRITAIN AND IRELAND

KENNETH BROPHY

PREAMBLE

If we believe that houses ‘are an arena in which cultural values, narratives of identity and the practicalities of daily life intersects’ (Brück 2008, 248) then they are key to our understanding of Neolithic society. Yet the study of ‘houses’ in the Neolithic of Britain and Ireland has until recently received relatively little attention. Why? First, it was difficult to identify where Neolithic people were living, and structures that could be comfortably interpreted as ‘houses’ were rare in most areas until the 1990s. Second, expectations of what Neolithic settlement would look like were unhelpful. Ideas of a sedentary lifestyle, fields, and farmhouses dominated discourse until the 1980s. Changes in our perception of Neolithic settlement patterns and a ‘boom’ in discoveries of occupation sites due to developer-funded excavations changed all of this. We have rapidly moved to a position where we have a wide range of occupation locations and houses, set within a framework of mixed mobility settlement patterns and regional and temporal variation, indicative of a range of rhythms of life. It seems likely that houses in the Neolithic were places where the mundane tasks of everyday life took place, and the fundamental structures and rules of society were maintained.

SETTLED AND UNSETTLED, HOUSE AND HOME

For much of the twentieth century Neolithic studies in Britain and Ireland took a sedentary farming lifestyle and the existence of houses for granted despite there being little evidence for either (Clark 1937). Early discoveries of Neolithic settlements such as Skara Brae, Orkney (Childe 1931) and Lough Gur, Co. Limerick (Ó Ríordáin 1954) were rare and apparently not representative. Surveys of Neolithic

settlement increasingly conceded that 'storage' pits were just about the only surviving traces of occupation sites across much of Britain and Ireland (e.g. [Field et al. 1964](#); [McInnes 1971](#); [Herity and Eogan 1977](#)). Debate inevitably turned to whether the paucity of houses was simply an absence of evidence, or evidence for absence ([Gibson 2003](#)). Explanations for the 'missing' houses ranged from the utilization of building styles that left no trace to the loss of evidence in the plough zone ([McInnes 1971](#); [Kinnes 1985](#), 25; [Gibson 2003](#), 137; [Loveday 2006](#)).

More recently an alternative narrative emerged: that 'the earliest settlement was scattered and mobile' ([Whittle 1988](#), 85). The notion that Neolithic people moved around and between temporary settlements emerged as a key aspect of the rethinking of the Neolithic that took place in the 1980s. Contrary to traditional expectations it was argued that, 'the majority of the population lived for most of the time in rather flimsy and temporary dwellings' ([Thomas 1996](#), 2). Within this framework, there was a tendency to emphasize the 'unusual' and non-domestic nature of the few buildings that had been found (e.g. [Thomas 1996](#); [1999](#); [Topping 1996](#)): their rarity meant they were exceptional, not everyday. This in turn allowed a re-evaluation of the appropriateness of the concept of 'house'. For a time, less loaded terms were preferred such as 'building' and 'structure' (e.g. [Barclay et al. 2002](#)). Concepts such as 'home' and 'household' were also critiqued ([Thomas 1996](#), 5).

This view of Neolithic settlement was not universally accepted (cf. [Cooney 1996](#); [Barclay 2003](#)). Developer-funded fieldwork in the 1990s and 2000s in Ireland and Scotland found more than 75 Neolithic buildings, permanent structures of an apparently domestic nature ([Grogan 2002](#); [Barclay 1996](#); [2003](#)). In Irish Neolithic studies at least, the term 'house' has always been used, although not uncritically in recent decades. [Cooney \(1999, 52ff\)](#) argued that 'house' and 'household' are perfectly acceptable in a Neolithic context given the cross-cultural nature of these concepts. He argued that archaeologists shied away from calling buildings houses because of the universal nature of the mobility model. Nonetheless, it is also the case that the mobility model may still have validity in southern England ([Thomas 1999](#); [Pollard 1999](#); [Bradley 2007](#)), where evidence for 'houses' is limited, although they have even been found here in recent years (cf. [Thomas 2010](#), 5). Therefore, there is now a greater acceptance that variable patterns of sedentism were evident in the Neolithic of Britain and Ireland, and this has been accompanied by a subtler approach to the classification of Neolithic structures. Such buildings are viewed somewhere between the poles of wholly domestic and wholly ritualistic which until recently had dominated discourse. For instance,

the mundane routines of everyday life could be viewed as ritualized actions ([Bradley 2005](#); [Whittle 2003](#)), a recurring theme throughout the remainder of this chapter.

HUT AND HALL

Buildings associated with the early centuries of the Neolithic are mostly wooden rectangular structures, ranging from long and thin, to almost square, and from a few metres across to over 20m in length. Although many of these have produced evidence for ‘domestic’ activity, such as hearths, cereals, pottery and so on, it is by no means certain they were all dwelling places, or permanently occupied. For the purposes of this chapter, it is assumed that any structures discussed potentially had some kind of domestic role.

The most coherent body of evidence for a rectangular house building tradition is found in Ireland ([Grogan 1996](#); [2002](#)) where some eighty such buildings are now known, some occurring in groups of two or three ([Smyth 2006](#), 234; 2010, 4) ([Fig. 17.1](#)). Whilst these buildings share a roughly rectangular footprint, there is a great deal of variation in size, with lengths typically between 6m and 12m ([Grogan 2002](#), 519). Often these buildings have one or more internal divisions splitting the building into ‘rooms’ and where found, entrance gaps tend to be on the short ‘gable’ ends or a corner. The buildings seem to have been constructed in a number of different styles, from planks set into a bedding trench to posts supplemented by wattle ([Smyth 2006](#), 238). Little is known about roofing material and in nearly all instances floors have been lost.

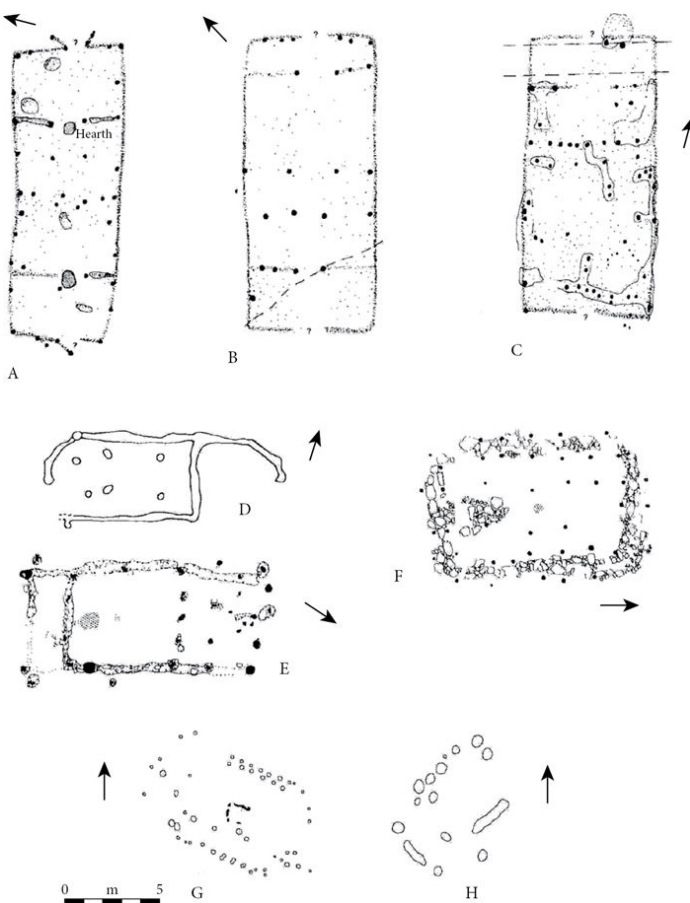


FIG. 17.1. Interpretive plans of early Neolithic rectangular timber buildings in Britain and Ireland. A—Lismore Fields A, Derbyshire, England; B—Llandegai, Gwynedd, Wales; C—Chigborough Farm, Essex, England; D—Ballygalley 1, Antrim, Ireland; E—Ballyglass 1, Co. Mayo, Ireland; F—Lough Gur A, Limerick, Ireland; G—Raigmore, Highland, Scotland; H—Kinbeachie, Highland, Scotland (A–C, [Darvill 1996](#), fig. 6.4; D–F, [Grogan 1996](#), fig. 4.2; G, H, [Barclay 2003](#), fig. 8.2).

[Darvill \(1996\)](#) compiled a group of 37 assorted early Neolithic buildings from England and Wales. These conform to a largely rectangular ground plan, although some are nearly square. They are generally small buildings, mostly 4–10m long and 3–7m wide ([Darvill 1996](#), 88), with rare larger structures, such as Lismore Fields 1, Derbyshire, at 15m in length ([Garton 1987](#)). Again, the plough-truncated nature of these structures means internal divisions, entrances, and hearths are not always clear, although most buildings seem to have had at least one partition. [Darvill \(1996\)](#) was able to identify a few different construction styles for these buildings, mostly posts set into slot trenches, with evidence for a single central roof

support at a few buildings. More recently, a few larger buildings have been found in southern England, such as White Horse Stone, Kent, measuring 18m by 8m and defined by ‘wall foundation gullies’ (Oxford Archaeological Unit 2000).

Early Neolithic buildings in mainland Scotland are rare, with settlement evidence dominated by scatters of pits, postholes, and slots (Barclay 2003; Brophy 2006). Barclay (2003) recorded only ten possible rectangular buildings in mainland Scotland, although some are little more than settings of truncated pits, such as Kinbeachie, Highland (Barclay et al. 2001). Since his review a possible post-built house, 15m by 6m, has been found at Laigh Newton, East Ayrshire (fig. 17.2). Most buildings had an association with cereals and Neolithic Carinated Bowl pottery, whilst some had hearths.

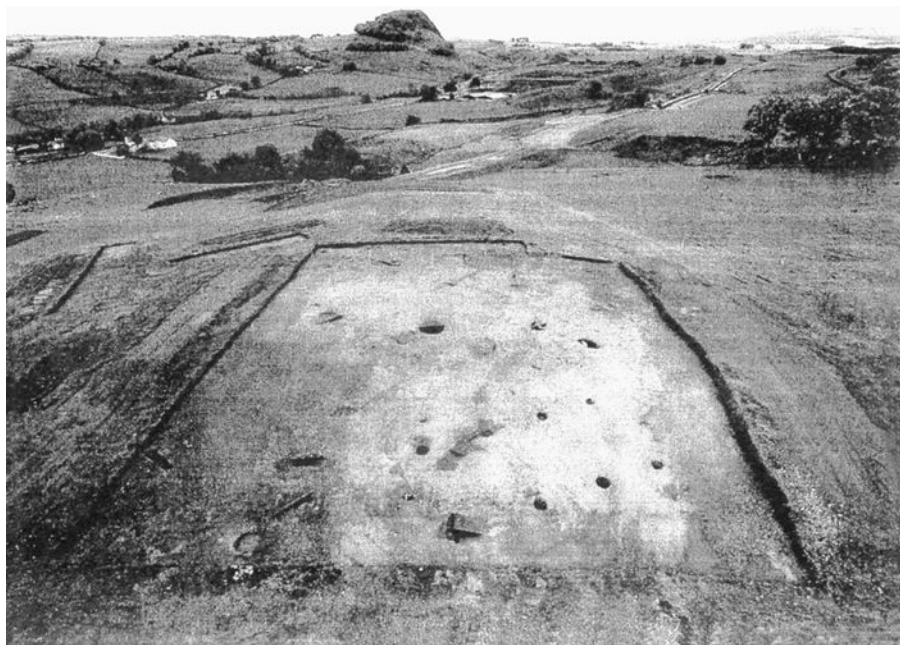


FIG. 17.2. Excavation of a possible Neolithic house at Laigh Newton, Ayrshire, located in the bottom right-hand corner of the trench (GUARD, aerial view taken by Edward Z. Smith, Hawkeye Photography).

These light wooden structures stand in stark contrast to the timber halls found in Scotland, the role of which is still open to debate. Four have been excavated: Balbridie and Warren Field, Aberdeenshire (Fairweather and Ralston 1993; Murray et al. 2009), Claish, Stirlingshire (Barclay et al. 2002), and Lockerbie Academy, Dumfries and Galloway (Kirby 2011). A few others have been recorded as cropmarks (Brophy 2007). These large buildings had a rectangular footprint, usually with slightly rounded ends, measuring in the range

of 22–27m long and 8–12m wide. Walls of large oak posts (presumably with wattle screening) or posts set into bedding trenches, and a series of internal posts, supported a roof that may have been 6–8m high. All had a series of internal divisions and entrances at one or both gable-ends, and Warren Field and Lockerbie may have had open yards attached (Fig. 17.3). These ‘halls’ have been interpreted as farmhouses, cult houses, feasting halls, or communal buildings used for a variety of roles (Ralston and Fairweather 1993; Topping 1996; Barclay et al. 2002; Cross 2003; Brophy 2007; Murray et al. 2009).

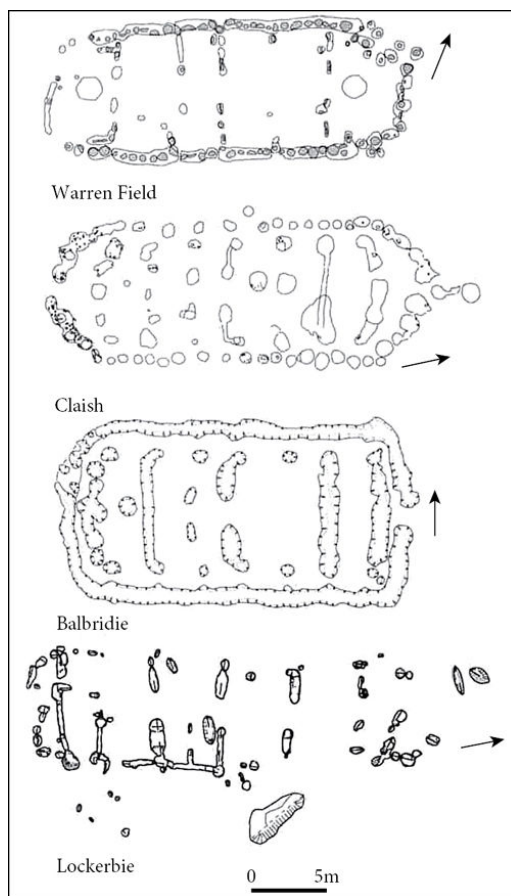


FIG. 17.3. Plans of the four excavated early Neolithic timber halls in lowland Scotland (copyright Oxbow Books, J.C. Murray, H.K. Murray and S.M. Fraser). From top to bottom: Warren Field, Aberdeenshire (Murray et al. 2009); Claish, Stirling (Barclay et al. 2002); Balbridie, Aberdeenshire (Fairweather and Ralston 1993); Lockerbie Academy (courtesy of Gordon Barclay, Ian Ralston, Magnus Kirby and CFA Archaeology Ltd).

Timber-framed rectangular buildings are found across much of Britain and Ireland, and appear largely to be an early Neolithic

phenomenon. For the most part, they were built, used and destroyed in the earliest centuries of the Neolithic; rectangular buildings are rare in the late Neolithic. The houses in Ireland may have endured for only a few generations or at most centuries, spanning the period of roughly 3800–3600 BC (McSparron 2003; Smyth 2010). The timber halls in Scotland had a relatively short currency, perhaps also 3800–3600 BC (Marshall 2009), although dating is less clear for the smaller timber buildings (Brophy 2006). Darvill (1996) noted rectangular buildings in England and Wales are largely the preserve of the ‘early and middle Neolithic’ whilst a large rectangular timber building at Yarnton, Oxfordshire was dated to 3950–3640 BC (Hey 2001). Certainly, by 3300 BC, house plans had begun to change (Darvill 1996; Grogan 2002; Brophy 2006).

ROUNDER HOUSES

Late Neolithic houses tend to have been ‘ephemeral and generally smaller and circular structures’ (Bradley 2007, 94). Not all were ephemeral: a number of roundhouses, so-called ‘Grooved Ware’ houses, typically consisted of substantial four-post arrangements within a ring of smaller posts, such as at Wyke Down, Dorset, Trelystan, Powys and Leadketty, and Perth and Kinross. Examples of these structures have now been found across Britain and Ireland (Thomas 2010; Smyth 2010; Noble et al. 2012). The connection with Grooved Ware, and a wider change in ceremonial monument shape from rectangular to circular, suggests that alterations in house plan almost certainly reflect wider changes within society towards the end of the fourth millennium BC (cf. Cooney 1999, 66ff; Thomas 2010).

The ephemeral form of most late Neolithic houses makes them difficult to find and identify (Fig. 17.4). Only three sites with oval buildings have been recorded in mainland Scotland (Barclay 2003; Brophy 2006). At Cowie, Stirling, there were eight overlapping stake-defined structures no more than 4.4m across (Atkinson 2002). Grogan (2002) has identified some 50 late Neolithic round or oval buildings in Ireland; most of these seem to have been defined by stakes set into a shallow bedding trench, and they are small, typically 4–7m across (Atkinson 2002, 109–110) with central hearths. Darvill (1996) listed 67 late Neolithic buildings in England, Wales, and the Isle of Man, although this included various sites perhaps better interpreted as timber circles. (Indeed, it is possible that in the Neolithic some roundhouses were symbolically and visually associated with timber circles (Thomas 2010, 8–9)). Confirmed domestic structures in England were often small, with stake supports for the walls, which

[Darvill \(1996, 93\)](#) argues would have supported animal skins or another form of weatherproofing. A remarkable group of small sub-rectangular houses was recently discovered at Durrington Walls, Wiltshire. The buildings had light timber-frames, wattle walls, plaster-floors, hearths and slots for wooden furniture ([Parker Pearson et al. 2006](#)). It seems likely that this 'village' of up to 300 houses is unique, and associated with work at nearby Stonehenge.

The internal layouts of the Durrington Walls houses bear an uncanny resemblance to the stone houses of Orkney. Although there are a few early Neolithic settlements, such as the Knap of Howar 'farmstead' ([Ritchie 1983](#)) and hints of earlier timber buildings, the majority of houses on Orkney are later in date, stone-built, and sub-rectangular, oval, or sub-circular in plan. 'Villages' at Skara Brae, Barnhouse, and Ness of Brodgar tell us a great deal about house architecture, economy, and community beliefs. The buildings typically had dry stone walls, with flagstone furniture and central hearths; were sometimes surrounded by (or dug into) midden; and most likely had pitched roofs supported by timbers and lined with straw, seaweed, turves, or thin flagstones. Buildings were adjoining and connected by low passages (Skara Brae) or more dispersed and clustered around a central yard (Barnhouse). Although most of these buildings appear to be largely domestic in nature, a range of 'specialized' ancillary buildings have also been noted, including workshops and exceptionally large communal buildings (e.g. [Childe 1931](#); [Richards 2005](#)).

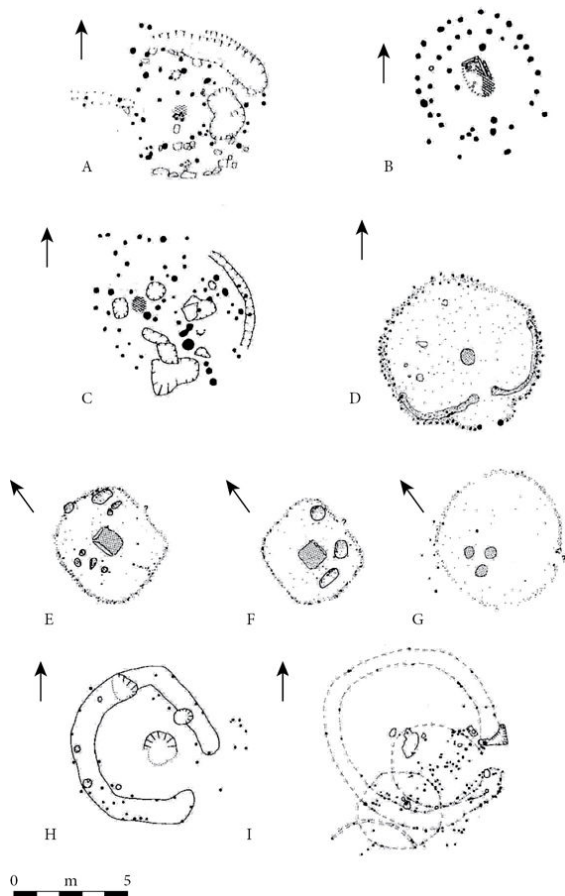


FIG. 17.4. Interpretive plans of various late Neolithic sub-circular buildings in Britain and Ireland. A, C—Lough Gur C1 and C2, Limerick, Ireland; B—SlieveBreagh 1, Meath, Ireland; D—Gwithian Phase 2, Cornwall, England; E—Trelystan A, Powys, Wales; F—Trelystan B, Wales; G—Hockwold-cum-Wilton, Norfolk, England; H—Beckton F111, Dumfries and Galloway, Scotland; I—Cowie, Stirling, Scotland. (A–C, [Grogan 1996](#), fig. 4.3; D–G, [Darvill 1996](#), fig. 6.10; H, I [Barclay 2003](#), fig. 8.5).

There are many dozen possible Neolithic stone houses on Shetland, often associated with field banks ([Calder 1956](#); [Barclay 1996](#), 62ff). Dating is patchy, but three sub-circular to oval buildings at Scord of Brouster dated to the late Neolithic ([Whittle et al. 1986](#)). These houses had thick stone walls, recesses in the walls, and hearths, and at least one was preceded by a timber ‘flimsy transient shelter’ ([Whittle et al. 1986](#), 133). There is similar untapped potential on the Western Isles ([Barclay 1996](#), 70). Evidence about the character of settlements has been gained from excavations at Eilean Domhnuill, North Uist, a settlement on an islet occupied from as early as 3600 BC for a millennium ([Armit 2003](#)). A sequence of small stone-walled

rectangular houses were constructed, perhaps only a few in use at a time, and it seems this location was used seasonally or periodically due to changing water levels (Armit 2003, 98).

There is a tendency for late Neolithic settlements to include a number of buildings, sometimes occurring in clusters, often with one building replacing the other rather than all being contemporary. This hints at groups returning to the same location, but not necessarily the same building, again and again. Grogan (2002, 524) has called oval timber structures ‘simple domestic dwellings’. These are at odds with the enduring stone buildings of Orkney and Shetland, although evidence suggests that even these ‘permanent’ buildings were being replaced and rebuilt through time. There seems to have been a concern with using, and reusing, the same places.

PITS AND MIDDENS

As noted above, the role of pits in identifying settlement locations has a long tradition in Neolithic studies (cf. Garrow, this volume). Initially, pits with Neolithic material were viewed as grain storage pits (or rubbish pits), and these often occurred in groups (e.g. Clark et al. 1960; Simpson and Coles 1990). As such, pit clusters were viewed as a proxy for settlement, with an assumption that associated buildings had been destroyed or remained undiscovered (e.g. Field et al. 1964, 367ff). However, Thomas (1999, 64ff) convincingly argued against the storage pit interpretation, using an alternative narrative developed in the 1980s, that of ‘structured deposition’. This does not mean they did not hint at domestic activity, as pits often contain the detritus of everyday life, from hearth sweepings and broken potsherds, to parts of quernstones. Pits may also be associated with pottery firing (Gibson 2002). The association of pits with a tent-like structure, cereals, and Carinated Bowl potsherds at Boghead, Moray (Burl 1984) suggested that early farmers had at least some temporary dwellings associated with pits.

Larger pit clusters are perhaps indicative of longer-term repeat visits, such as the 226 Neolithic pits excavated at Kilverstone, Norfolk (Garrow et al. 2005). These relatively small pits were arranged in several large groups and pits commonly overlapped one another. Most seem to have been opened and filled fairly quickly, and contained a wide range of material including pottery, burnt flint and stone, and carbonized organics; refits of material between small groups of pits were common. The excavators concluded that the pits indicated repeated visits over several centuries, with groups possibly occupying the area for a short period of time only. A similar pattern can be seen

at Dubton Farm, Angus, where huge pits 2.7m across and 1.85m deep were dug to receive a range of deposits including potsherds and carbonized material (Cameron 2002); this location was re-used throughout much of the Neolithic.

Middens also hint at long-term patterns of deposition. Spreads of deposit within hollows at Eton Rowing Course, Buckinghamshire, consisted of thousands of potsherds, lithics, and fragments of animal bones and quernstones (Allen et al. 2004, 85ff). The excavators noted nothing ‘exotic’ and these deposits were viewed as indicative of long-term dumping of domestic ‘rubbish’. No buildings were found in the vicinity. Spreads of occupation debris associated with multiple stake-holes suggest middens, pits, and temporary buildings/shelters were located together in Ireland in the middle Neolithic (Smyth 2010, 14ff). Pits and middens, then, are indicative of depositional activity at certain locations, and can offer an insight into the disposal of domestic and other materials, including patterns of leaving and returning to special locales (Pollard 1999).

CRAFT AND DESIGN

Buildings are almost always culturally significant in terms of use *and* social meaning (Samson 1990; Parker Pearson and Richards 1994a). Houses can form a sense of rootedness for communities, are related to family and kin, and are usually the medium for a range of routine activities. The materiality of buildings, their appearance, and layout can be meaningful in a range of ways, and it seems likely that this was the case in the Neolithic (Cooney 1999; Bradley 2005). Unfortunately, in Britain and Ireland, the evidence we have is largely plough-truncated and sub-surface. Most organic building materials are elusive archaeologically, whilst the height of walls, as well as roofing, are speculative. Inevitably, any discussion will draw disproportionately from stone buildings.

The act of entering—or looking—into these buildings would have been mediated (and controlled) via entrances, but we have little understanding of doorways in Neolithic houses other than their location. We have no sense of what ‘doors’ would have looked like, and it may be wooden buildings were sealed by a wattle screen or similar. The role of doorways as means to allow light into these buildings is a possibility: where ‘entrances’ have been identified, they are largely in the southern and eastern sectors (Topping 1996). Entering any building involved crossing a threshold, a liminal experience that may have been associated with rites of purification or a transformation (cf. Parker Pearson and Richards 1994b, 25). Entry

into Balbridie and Claish timber halls would have been physically awkward, channeled through narrow and angled entrances (Barclay et al. 2002). Threshold slabs within entrance passages of Orcadian houses marked this change from outwith to within, and at Barnhouse one threshold may have involved crossing a burial cist (Richards 1990, 116; 2005).

This control continued within buildings. Upon entry to Orcadian houses, movement to the right was encouraged by flagstones and paving (Richards 1990, 116–117), and paving acted in a similar way at Lough Gur house A (Cooney 1999, 59). In timber buildings, a range of internal partitions further controlled movement—acting as ‘barriers’, as Topping (1996) put it—as well as defining spaces for different activities. Screens (perhaps movable) divided many Irish and English rectangular houses into two or more ‘rooms’, often with one considerably larger than the other(s) (Darvill 1996; Grogan 2002). The larger space, and single room buildings, could be interpreted as main residential spaces (Grogan 2002) often with a hearth. Smaller ‘annexes’ may have been storage spaces, working areas, cooking areas, or small animal byres (Cooney 1999; Grogan 2002). In some cases, internal timbers may have been arranged for pragmatic reasons such as supporting the roof, and in turn may have facilitated storage space or even an ‘upper floor’ in larger buildings (Barclay et al. 2002). It seems likely that access to certain internal spaces was controlled, whilst certain acts would only have been appropriate in some rooms.

Central to many of these spaces was the hearth. Ubiquitous throughout domestic sites in Britain and Ireland, hearths and fire-pits have been regarded as indicative of domestic activity (Smyth 2006, 241). Some may have been ‘covered ovens’ or cooking pits (Darvill 1996, 89–90). Where found, hearths tend to have been centrally located in buildings or the main ‘room’ (although some external hearths have been recognized). Hearths brought people together; heel or buttock marks around hearths in the Durrington Walls houses indicated people squatting around the fire (Julian Thomas, pers. comm.). Richards (1990) has described the hearth as the *axis mundi*, providing light and warmth for the inhabitants of the Orkney houses. When one house replaced another, the original hearth was often retained. Movement within the house would have centred on the fireplace (Cooney 1999, 61) and this would have created spaces associated with light and shadow. The fire offered a means to cook (although such processes may have more commonly occurred outside in large communal hearths, such as at Barnhouse) but may also have meant the houses were smoky places. Central fire-pits may also have been a focus for deposition and transformative processes, such as the pit lined with burnt broken pot at Claish timber hall (Barclay et al.

2002). Hearths also found their counterparts at some monuments—stone settings within the Stones of Stenness henge and Maeshowe passage grave mimic the substantial stone-lined hearths in Orcadian houses and ‘village’ yards (Richards 1990). Fragments of burnt human bone were found in such a hearth at the Raigmore late Neolithic timber building, Highland (Simpson 1996).

Arranged around the hearth were other fittings and fixtures, although again we have little evidence for this outwith Orkney other than scattered pits and stake-holes. The stone buildings in Orkney offer the most compelling evidence for ‘furniture’, including possible box beds, storage spaces, and so-called ‘dressers’ (Clarke and Sharples 1985; Richards 2005). Slots for wooden equivalents of these were also identified at Durrington Walls (Parker Pearson et al. 2006). A convincing argument can be made for the Orkney and Durrington Walls houses that they shared ‘both ontological and metaphorical knowledge of the world’ (Richards 1990, 113). For instance, the cruciform layout of Orkney buildings with central hearth and beds to left and right recurred repeatedly, and one can imagine screens, partitions, and posts performing a similar role in timber buildings (Brophy 2007). The reading and experience of buildings, then, may have embodied many characteristics we more usually apply to ritual, and burial, monuments.

LIFE AND DEATH

A connection between houses and tombs has been recognized across much of Europe, where longhouses had a similar appearance and symbolism to longbarrows (Midgley 1985; Hodder 1994; Bradley 2005). There are also many examples of houses under burial monuments (Hodder 1994, 77ff) and in some cases abandoned houses may have been the inspiration for burial monuments (Bradley 1996).

In Britain and Ireland a range of occupation sites were built on, or replaced by, megalithic and earthen burial monuments. For instance, a posthole-defined structure with a hearth, interpreted as an early Neolithic house, was found beneath Hazelton North longbarrow, Gloucestershire (Saville 1990, 14–21). Scatters of features, but with no obvious structure, were found beneath Camster Long chambered tomb, Highland (Masters 1997). Examples are more commonly found in Ireland (Cross 2003, 200; Grogan 1996, 57). The remains of two rectangular timber buildings at Ballyglass, Co. Mayo, were discovered beneath a court-tomb; at least one of these may have been destroyed in advance of tomb construction (Ó Nualláin 1972). In the late Neolithic, at Knowth, Co. Meath, a large passage tomb (Eogan and

Roche 1998) covered nine circular stake buildings. The location of occupation traces beneath burial monuments, in the form of pits, hearths, plough-marks, or houses suggests an enduring significance of certain locations, and some may have been more easily remembered through being marked by a mound or megalith (Hodder 1994).

Further connections between burial monuments and houses are apparent in Orkney. Houses share a cruciform layout with Maeshowe-type passage graves, and Maeshowe itself was probably constructed on the location of a house-like structure (Richards 2005). The use of large stones and orthostats to define space are common characteristics of tombs and houses in Orkney and Shetland, whilst the typical house structures in Shetland are heel-shaped in plan, as are most of the local chambered tombs (Whittle et al. 1986, 134; Barclay 1996, 63). Shared architectural traits may also characterize timber buildings. Split half tree trunks are commonly found beneath barrows, and such timbers were used in the construction of Warren Field timber hall (Noble 2006a; Murray et al. 2009). More generally, large timber buildings have been associated with other Neolithic monuments from cursuses to timber circles (Barclay et al. 2002, 122; Brophy 2007; Thomas 2006; 2010).

Houses offered connections between life and death as well as the domestic and ceremonial. They may also have embodied ancestral connotations, of early farmers, pioneers (Murray et al. 2009), and the wild wood (Noble 2006b). It may even be that houses were associated with specific individuals and groups, an embodiment of social memory and personal biography. We have little sense of the lifespan of most houses, although many were not built to last substantial periods of time. Even if places endured, buildings did not. In all likelihood, the timber halls stood for no more than 50 years (Marshall 2009), and even the stone houses of Orkney and Shetland were frequently replaced or rebuilt. We have limited evidence for repairs and maintenance at some buildings, and this may be indicative of people returning to a location after an absence and carrying out restorative work (Pollard 1999). Within oval stake-house groups, huts were simply abandoned and new ones built in more or less the same place, probably for the same reason. Bradley (1996, 248) has suggested that the length of time a house stood for was determined by the 'social lifespan of the household'. So when a householder died, perhaps the house was abandoned as well. Houses themselves became memorialized through being dismantled and destroyed.

The death of individuals was met with a range of strategies, and in the early Neolithic timber buildings were mostly burnt (or perhaps cremated), often charring posts even beneath ground level. Experimental work suggests this would have been a substantial task

(e.g. [Bankoff and Winter 1979](#)). To burn down any reasonably sized timber-framed building would have taken much planning and pyre material, and several days of hard work. Such spectacular drawn-out events would have seared themselves into the communal biography through the creation of ‘flashbulb memories’ ([Noble 2006a](#)). Such an act of ‘purification’ was perhaps necessary ([Smyth 2006](#)) because of the death of an individual. The death of houses and houses for the dead seem to have been closely connected motifs throughout the Neolithic.

CONCLUSION

The evidence for Neolithic houses in Britain and Ireland is now compelling: there is no doubt that people were living and sleeping in some of the structures discussed in this chapter, although whether all year round remains to be seen. [Smyth \(2006\)](#) noted that evidence for cooking food, tool manufacture, cereals, and cereal processing, as well as the presence of hearths and in some cases ovens, suggest ‘domestic’ activity at the Irish sites at least. The size of most of these small buildings suggests most could have accommodated a ‘family size’ group of perhaps 5–12 people ([Grogan 2002](#), 520). Larger clusters of buildings from Durrington Walls to Orkney suggest groups of families living together, apparently sharing communal yards, hearths, and ancillary buildings by the late Neolithic. Some settlements may have been permanent, but there seems also to have been a network of overnight, specialized, and seasonal camps scattered across the landscape. Exceptionally large buildings such as the timber halls may have served some form of domestic role, and offered fixed points for a large group of people. In other words, Neolithic settlement evidence suggests a nested scale of temporalities, with clear regional variations. Importantly, such sites offer a window into the rites and social organization of Neolithic people across Britain and Ireland. Neolithic settlements, then, were places of ritual and routine, played out in the form of social obligation and good housekeeping.

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CHAPTER 18

PLACES OF SETTLEMENT IN SOUTHERN SCANDINAVIA

MATS LARSSON

INTRODUCTION

DURING the past couple of decades our understanding of the Neolithic settlement structure and how people used their landscape in southern Scandinavia has fundamentally changed. The foundation for this marked change in our understanding of how Neolithic communities organized their settlements is to a large degree based on the development of contract archaeology. Large-scale excavations, stretching in several cases over years, have given us evidence for complex Neolithic settlements that was unheard of twenty-five years ago. There is now a well-defined house typology with clear chronological implications for this region. This chapter discusses Neolithic settlement, focusing on chronological and regional patterns in the design and use of buildings, the spatial arrangement of settlements, the landscape location of settlements, and activities at these places.

THE END OF LATE MESOLITHIC SETTLEMENTS

The large coastal sites inhabited during the Ertebölle period (c. 5400–4000 BC)¹ were more or less abandoned as permanent settlements after having been in use for about 1,000 years. For instance, the Björnsholm shell midden in northern Jutland was in use from c. 5050–4050 BC ([Andersen 1993](#), 59–61). The only substantial features found in the midden were hearths: there were no traces of huts, pits, or postholes. Yet late Mesolithic houses and huts have recently been excavated at Tågerup in western Scania ([Karsten and Knarrström 2001](#), 83ff). The chronology of these houses is complicated as there are few Mesolithic radiocarbon dates ([Karsten and Knarrström 2001](#), 147), meaning that dating has relied on a study of the transverse

arrowheads (Vang-Petersen 1984). The houses were inhabited during the early and middle phases of the Ertebölle culture, whilst the presence of Ertebölle ceramics from House III suggests a late Ertebölle date (c. 4600–4000 BC) (Karsten and Knarrström 2001, 143; cf. Hallgren 2004, 136). These middens often show continued periodic use after c. 4000 BC. Inland settlements are also known from many parts of southern Scandinavia (cf. Fischer 2002, 369; Larsson 1982, 1983; Karsten 2001).

EARLY NEOLITHIC (FUNNEL BEAKER (TRB): C. 3950–3300 BC)

In the early Neolithic, people's view of their environment—and accordingly their world view—changed, resulting in the building of earthen longbarrows and other types of monuments as well as new types of houses. It is also interesting to note that the same types of houses were built at the same time by people who were using different types of pottery (Oxie, Volling, Svenstorp and so forth; see Petersen and Müller, this volume). People during the late Mesolithic built dwellings in a diversity of ecological areas ranging from the fjords of eastern Jutland to the inland of Scania, whilst in the earliest part of the early Neolithic new areas inland, preferably away from the late Mesolithic sites, were occupied, preferably sandy soils close to water (cf. Madsen 1982; Larsson 1984). These early settlements sites have usually been seen as small, but this notion is under discussion as new evidence from, for example, Dösjebro in Scania indicates the existence of several potentially contemporaneous houses (cf. Larsson 1984; Kyhlberg et al. 1995; Andersson 2003, 75).

Many of the earliest TRB sites consist of different types of pits, sometimes in their hundreds, and little else (Larsson 1984, 1985). These pits were frequently recut and re-used, and contained large amounts of flint debris as well as unused implements like flake axes, flake scrapers, and in some cases even complete vessels (M. Larsson 1984). Several of these sites were situated on ridges or small hills in the undulating landscape. If we accept these places as not only ordinary settlement sites but as places of special virtue for the people of the day, we can see these places as evidence for an early 'monumentalization' of the landscape (Larsson 2007a).

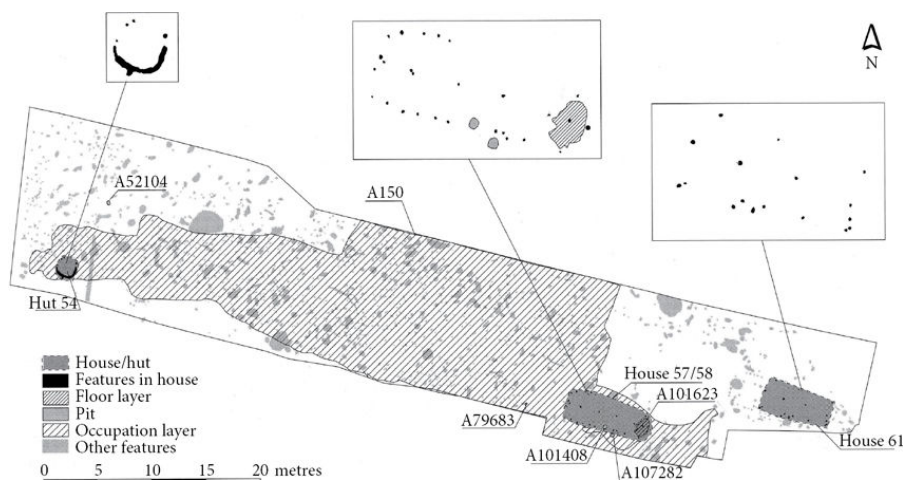
Houses of different types have also been excavated in both Denmark and southern Sweden, though most of these early excavations that mention houses or huts are hard to interpret and most of the Danish ones were also to a large degree discarded in an article concerning house construction some years ago (Eriksen and Madsen 1984).

Classic examples of re-interpretation are Barkaer and Stengade in Denmark, which were both interpreted as longhouses but were later convincingly re-interpreted as longbarrows ([Skaarup 1975](#); [Madsen 1979](#); [Liversage 1992](#)). Probably the first time a proper longhouse was excavated was in 1986 at Mossby, in the most southern part of Scania ([M. Larsson 1992](#)). The Mossby house, now a 'type site', was c. 12 by 6m in size, with three large postholes in the centre to support the roof. The remains of the wall were made up of rather shallow postholes and the form of the house was elliptical. A layer consisting of sooty sand and occupational debris covered an area of about 70sq. m, largely within the walls and fitting the shape of a floor depression. There were few artefacts, but these included cord-decorated pottery and flint waste. Some 10m east of the house a 280sq. m area was excavated, rich in occupation debris, including pottery and flint. Beneath the debris pits, patches of soot and postholes were found, but it was not possible to delimit any houses in this area ([M. Larsson 1992](#), 66; [Larsson and Rzepecki, 2005](#)). The pottery found in the layer and in the pits was identical to that found in the layer that covered the house. The five available radiocarbon dates are all in the range of 4100–3900 BC, putting them among the earliest in southern Scandinavia ([M. Larsson 1992](#), 74). These dates have been doubted, especially the oldest ones, which derive from charred food residue ([Persson 1999](#)).

Of the 36 houses currently known from early and middle Neolithic southern Scandinavia 17 are Mossby-type houses, and these can be dated from the earliest Neolithic up until the early middle Neolithic ([Svensson 2003](#), 123). The size of these buildings varies between 36 and 128sq. m. Houses of this type have been excavated at several places on Öland, in eastern central Sweden ([Papmehl-Dufay 2010](#); [Larsson 1994](#); [Carlsson 2004](#); [Ahlbeck and Artursson 1996](#); [Hallgren et al. 1997](#); [Hallgren 2008](#); [Stenvall 2007](#)). For instance, at the site Skogsmossen in the county of Västmanland a house of Mossby type was identified on the basis of a stone-free area devoid of finds within areas of occupation debris ([Hallgren et al. 1997](#); [Bradley 2005](#)).

Large-scale rescue excavations have for many years been important in bringing forward new material. In connection with the extensive excavations performed in western Scania for a new railway at the end of the 1990s a large number of early Neolithic settlements were excavated. On several of these sites, houses have been found. In the vicinity of the village of Dagstorp outside the city of Lund, on slightly undulating farmland along a river valley, probably the largest number of Neolithic houses in southern Scandinavia has been excavated ([Andersson 2003, 2004](#); [Svensson 2003](#); Fig. 18.1). The settlements make up a sequence from the earliest Neolithic to the central part of

the middle Neolithic. Different types have been distinguished: Mossby-type houses, and three others that will be discussed later; Dagstorp-type 1 houses, Limensgård houses, and Dagstorp-type 2 houses (Svensson 2003). The latter type of houses belongs to MN A and MN B, and these are basically derivatives of the Mossby house. A number of what have been interpreted as huts were also found. Most of the early Neolithic houses found at Dagstorp and elsewhere were situated close to or were covered by a layer of occupation debris, and pits were common features of these settlements (Svensson 2003, 75). The large scale excavations have demonstrated that settlements could be very large: up to several thousand square metres (Svensson 2003, 132). The Mossby house was very clean—a feature matched elsewhere—and we can infer that most activities took place outside the houses (M. Larsson 1992). It is of course also possible that some activities took place inside the house but debris was removed and deposited elsewhere.



Plan of Dagstorp 19 (SU21) during EN I.

FIG. 18.1. Early Neolithic houses at Dagstorp, western Scania (Andersson 2004).

Settlement evidence from Denmark is rather different. In most cases the excavated areas around the structures are too small to draw comparisons with the Swedish evidence (cf. Buus-Eriksens 1992), but there are exceptions, like the Mossby-type house excavated at Skraeppekaergård in northern Zealand (Kaul 1997). Areas of occupation debris (including pottery and flint) were situated 4–8m from the house and covered areas of 25 by 25m and 20 by 20m.

The picture that we today have of early Neolithic settlements is based on excavations in a rather small number of well-researched areas like southern Sweden, parts of central Sweden, the island of

Bornholm, and parts of Denmark. We can discern several types of houses, such as, for example, Mossby houses, D-shaped huts and horseshoe-shaped features. There seem to be some regional—and local—variation but the evidence for this is inconclusive. The size of the sites varies but this may be a factor of the scale of different excavations.

THE MIDDLE NEOLITHIC

The evidence for houses of any kind from the middle Neolithic (c. 3300–2350 BC) is scant in comparison with the preceding period (Larsson 1995; Larsson and Olsson 1997; Svensson 2003, 115). The middle Neolithic is usually divided into MN A (c. 3300–2700 BC: TRB and Pitted Ware culture (PWC)) and MN B (c. 2700–2350 BC: Battle Axe culture (BAC) and Single Grave culture (SGC)). The literature regarding the different culture groups and their relationship is today vast and almost impossible to review (cf. Edenmo et al. 1997; Malmer 2002; Larsson 2006; Pappmehl-Dufay 2006; and see Thorpe, Rowley-Conwy and Legge, and Petersen and Müller, all this volume) but, in brief, the TRB, BAC and SGC have been linked with farming and animal husbandry, whilst the PWC has been seen as subsisting by hunting and gathering.

Middle Neolithic A

The single-aisled houses of the Mossby type obviously have a long time span, from EN up until the beginning of MN A (Svensson 2003, 116), but from this point on very few Mossby-type houses have been found. During the very extensive excavations in the Malmö area in the 1990s and 2000, no single house datable to this period has been found. Indeed, in most areas of southern Scandinavia there are no houses from the earlier part of the MN A. The first houses in the area belong to MN B, leaving a long hiatus. During the late MN A the situation changed, with a few excavated houses from southern Sweden. From the extensive excavations at Dagstorp mentioned earlier we have a couple of MN A houses associated with TRB artefacts. The Scanian houses have no wall trenches and the houses are orientated east–west or north-west/south-east, c. 13.5 to 19m long by 5 to 7m wide, and with between three and six internal roof supports (Svensson 2003, 116ff).

During the large excavations at Limensgård and Grödbygård on Bornholm several houses of different types and age have been documented (Nielsen and Nielsen 1985; Kempfner-Jørgensen and Watt

1985; Nielsen 1999). The sites are dated with radiocarbon to between c. 2900–2700 BC. Mossby, Dagstorp and Limensgård type houses are present. The difference between them is sometimes subtle. The settlements have a long duration and have been extensively used from the early Neolithic up until the late Neolithic. At Grödbygård two late MN A houses were excavated. House A measured c. 13 by 7m. The rectangular outline of the house was shown by a partially preserved wall trench, and three roof supporting posts ran along the axis. House B was badly preserved and lacked any trace of a wall trench, but had the same three roof supporting posts and was no more than 10–11m long (Kempfner-Jørgensen and Watt 1985, 87ff). At Limensgård one late MN A house (Y) was excavated (Nielsen and Nielsen 1985, 102f). This house is quite similar to the ones from Grödbygård. The full length of this house cannot be determined; however its preserved portion is about 18 by 6.2m. There are five central postholes and a narrow wall trench was preserved in the northern part.

To summarize, the number of houses from early MN A is small and the houses of the Mossby type seem to prevail. At the end of the period the number of houses is larger and a new type of house defined by a wall trench is introduced. How then can we interpret these changes? During late MN A there is a lot of evidence for a rapidly changing TRB society in which the use of, for example, passage graves stopped. We can also see that in some well-researched areas in Scania it is possible to see marked changes in settlement structure as early as MN III (the middle part of MN A). In many areas we have been able to trace continuous TRB settlement from at least the late EN up until MN III, followed by a rapid change around 2700 BC when the old settlement regions were partly abandoned and new regions came into use (M. Larsson 1992; Andersson 2004).

Pitted Ware culture huts and houses date from the MN A into the MN B. The youngest radiocarbon dates from PWC sites in eastern central Sweden are 2880–2490 BC from Åby and 2580–2450 BC from Bollbacken. These stretch well into MN B (Artursson 2006, 50). At Åby a hut c. 5.5 by 2m was excavated in 1992 (M. Larsson 1999, 2003, 2006). Beneath a layer with red-brown sand several features, such as pits, postholes, and what has been interpreted as pit house, were found. A number of postholes were found, and in the close vicinity of the structure at Bollbacken four post-built huts, 2 by 6m in size, were documented (Artursson 2006, 50ff). Each hut was associated with activity areas, cooking pits, postholes and hearths (Artursson 2006, 50f). In House 3, as well as in features associated with it, cremated human bone and animal bones were found. The excavator interprets the construction as a ritual building with an associated area around it that was used for ritual activities like

funerary rites ([Artursson 2006](#), 55f). What have been interpreted as ritual areas, pits, and structures are not that uncommon on Pitted Ware sites ([Larsson 2007b](#)). Further to the north at Fräkenrönningen a settlement, radiocarbon dated to 3090–2390 BC, resembled the site at Bollbacken in that six of the huts were situated in a semi circle around an area more or less empty of finds ([Björck 1998](#); Fig. 18.2). The site covers an area of about 50 by 30m. In this area seven, possibly eight, hut structures were excavated. They were all visible as semicircular stone foundations and soil colorations ([Björck 1998](#); 21). The hut circumferences varied between 5.5 and 14.7m.



FIG. 18.2. The Pitted Ware site Fräkenrönningen (HG = House foundation) ([Björck 1998](#)).

Further up the Baltic coast near Örnsköldsvik two sites were excavated on a large scale; Bjärstamon and Kornsjövägen ([Gustafsson and Spång 2007](#)). Kornsjövägen comprised at least five houses in an area c. 120 by 120m and was situated in a very steep and stony area. The houses are of different types; partially dug out, stone foundations

and round houses ([Gustafsson and Spång 2007](#), 195ff). The best preserved house (1) was partially dug into the slope and had a rectangular shape, 15 by 14.5m. The site at Bjärstamon had a completely different location in the landscape. It was located on a sandy slope towards the sea. A total number of twelve houses were documented in the 650 by 50m excavation, but only five were actually excavated. The houses are of three types: rounded, oval and rectangular. The last mentioned were placed along the beach with the long sides facing the sea. The chronology of these sites is based on both radiocarbon dates and pottery and suggests three phases: 1. 2800–2600 BC; 2. 2600–2400 BC; 3. 2400–2100 BC. During these phases the house designs barely changed.

Middle Neolithic B

In the period c. 2700–2400 BC we see the existence of several different groups of people in southern Scandinavia who manifested their social identity through variation in their material culture, especially pottery but also flint and stone working (in our terms, PWC, BAC, and SGC). These groups of people all existed at the same time but chose to inhabit very dissimilar locations, and they probably all had quite different economic strategies as well: they were ‘living in cultural diversity’ ([Larsson 2004](#)).

When [Mats Malmer \(1962\)](#) wrote his eponymous book about the BAC no excavated settlement sites existed and he defined a BAC settlement as a site with at least one sherd of BAC pottery ([Malmer 1975](#), 52). The number of excavated settlements that can be attributed to this in comparison to the periods discussed above is still very modest, making it difficult to discuss and interpret settlement structure or settlement organization. Only three houses in all the extensive excavations from western Scania can be dated to MN B and the BAC. The Dösjebro 19 house is not complete but, based on a single row of roof supporting posts, the size of the house has been estimated as 26 by 6–7m ([Andersson 2004](#), 116–117). In the eastern part of the house two small, shallow, bowl-shaped pits were excavated. A large quantity of charred seed was recovered, and one grain of wheat provided a radiocarbon date of 2290–2040 BC. This corresponds to the transition between the middle and late Neolithic ([Andersson 2004](#)). Two similar houses have been excavated at Dagstorp 19 and Dagstorp 11, providing radiocarbon dates of 2570–2320 BC ([Andersson 2004](#), 118) and, from Dagstorp 11, 3020–2700 BC and 2280–1980 BC. According to the excavator, the later date is the most reasonable ([Andersson 2004](#), 119).

The large-scale excavations in western Scania have, in comparison

with earlier periods, left us with few datable MN B houses or settlements (Rostovanyi 2007, 59; Svensson 2003, 142). From the site Lockarp 7A there is one house about 14m long, and one row of roof supporting posts and a slightly oval form exist. The living area is estimated to about 50sq. m. The dating of the house to the BAC is based on a radiocarbon date and some flint (Rostovanyi 2007, 37, 61). A final Scanian BAC house was excavated in a smaller project near Ystad (L. Larsson 1992). The excavated revealed a 'pit house' (L. Larsson 1992, 114; Larsson and Olsson 1997, 270ff): the pit produced a dark-coloured trapezoidal depression 13.5 by 7m (Larsson and Olsson 1997, 104). In addition to the depression 27 posts were documented at the bottom of the depression as well as to the east and west of this. It is not possible to establish a clear pattern with regard to the position of the posts (Larsson and Olsson 1997, 106). A small amount of late BAC pottery and flint were recovered, along with evidence for small scale manufacture of axes. Four radiocarbon dates (from hazelnut shell, food residue, and charcoal) place activity in the period c. 2580–2330 BC (Larsson and Olsson 1997, 113; Svensson 2003, 143).

Four more BAC houses have been found near Linköping in Östergötland in eastern central Sweden, one of which was covered by occupation debris including flint, quartz, and pottery (Larsson and Olsson 1997, 288). Characteristic BAC pottery sherds were found in the houses. All four of these houses were rectangular, c. 10 by 5m in size, and provided MN B radiocarbon dates. Other than these BAC houses, what has been interpreted as a cult house has been excavated at Gläntan, south of Stockholm (Lindström 1994). The shape of the house is slightly trapezoidal with four large corner posts, and it is smaller than the others, at 4.6 by 2.8m. It is interpreted as a cult house based on a large quantity of cremated human bone found in the building. The dating of the structure to the Battle Axe culture is based on a large amount of characteristic pottery and axes (Lindström 1994, 59ff).

The known settlements with houses from the Single Grave culture in Denmark are few. At Hemmed, East Jutland, a total number of nine houses have been excavated. Chronologically they span the period from the late SGC until the early Bronze Age (Boas 1993, 119ff). The oldest measures 16 by 6m and had slender, slightly oval wall post holes; the roof supporting construction was made up of three internal posts 5–6m apart. Scattered in the bottom layer and over most of the excavated area in and around the house, pottery from the late SGC was found (Boas 1993, 127). Pieces of thick-butted axes, adzes, and three D-type arrowheads complete the picture. House VI is radiocarbon dated to 2500–2400 BC (Boas 1993, 127). A similar house

was discovered at Enderupskov in southern Jutland ([Ethelberg 2000](#), 120).

Marked changes in the settlement pattern can be detected in connection with the transition to MN B and the rise of the Single Grave and Battle Axe cultures in southern Scandinavia. It is obvious, though, that basically the same areas as before were used for settlement ([Andersson 2004](#), 200). This was already noted by Mats Malmer in the 1960s ([Malmer 1962](#)). In many regions in for example Scania, as discussed above, this change can be traced back to MN A III ([Malmer 1962](#), 200ff; [M. Larsson 1992](#), 84f). The oldest BAC graves as well as the oldest types of battle-axes are, however, to be found in small sites with few finds in regions with little preceding settlement evidence ([L. Larsson 1992](#)).

LATE NEOLITHIC

The transformation to the late Neolithic (c. 2350 BC) is characterized by an expansion into new regions ([Larsson and Olsson 1997](#), 215). The period has often been seen as a transition from a diversified society in the middle Neolithic to a more unified one in the late Neolithic. This notion is based on what appears to be a universal material culture, with flint daggers replacing battle-axes as a male prestige artefact ([Vandkilde 1996](#)). Gallery graves with stone packing or under flat earth have been seen as characteristically late Neolithic, and earthen flat graves were also common (see [Sjögren](#), this volume).

Before the 1980s the number of house remains was very small in southern Scandinavia (cf. [Björhem and Säfvestad 1989](#)). One of the most intensively surveyed areas, also with some of the largest excavations, in southern Scandinavia is the Malmö area. [Nils Björhem and Ulf Säfvestad \(1989\)](#) recognized ten different types of houses datable to the late Neolithic and the early Bronze Age. The types stretch from pit houses via longhouses with a partially subterranean floor to ordinary longhouses. As in the periods before, a two-aisled system of roof supports is characteristic. This type of house, and variants thereof, has been excavated from Jutland in the west to eastern central Sweden to the north. One of the more ground-breaking excavations was the one in Fosie IV in southern Malmö in the early 1980s, where 12 houses divided on to five different settlement areas were excavated ([Björhem and Säfvestad 1989](#); Fig. 18.3). Out of the 12 houses, five are so similar that we can talk of a 'type house', with a rectangular shape, three roof supporting posts and inward-angled wall posts. The length varies between 13.4 and 17.4m and the width between 5.8 and 6.7m ([Björhem and Säfvestad 1989](#), 70f). Based on the

extensive excavations it has been suggested that the settlement structure in the Fosie area was based on single farms made up of a couple of buildings, or sometimes maybe only one building. The buildings were relocated in the same area a couple of times (*Björhem and Säfvestad 1989*, 126). This pattern has been recognized during other later excavations in the Malmö area, and it has been suggested that each settlement was used for a couple of generations and then moved (*Björhem and Staaf 2006*, 138). It has also been noted that there is a development from shorter, more simple, buildings to longer, more elaborate ones (*Björhem and Staaf 2006*, 139). This is particularly noticeable at the site Almhov in Malmö where as many as 38 longhouses were found along a ridge. The distance between them was 50–150m and some of these houses were quite large; 35m long and 6–6.5m wide. One of the largest has been radiocarbon dated to 1890–1680 BC (*Artursson 2009*).

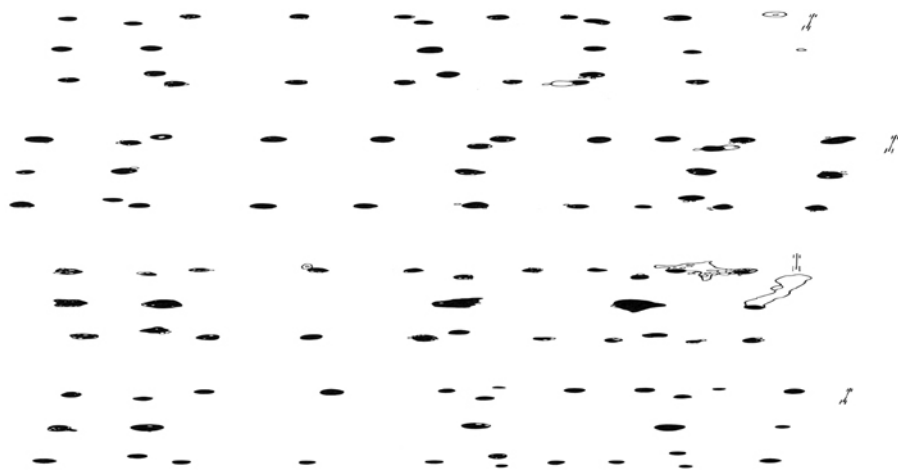


FIG. 18.3. Late Neolithic houses from Fosie IV, Malmö (*Björhem and Säfvestad 1989*).

Examples of another type of house were first excavated at Limensgård on the Danish island Bornholm. These were found to have a length of between 32 and 44m, and with a width of between 6.5 and 8m. As at Fosie, the wall posts were set angled inwards. The houses at Limensgård that have preserved ends have a rounded shape to these ends. A variation on this type of house was found at Piledal in south-eastern Scania (*L. Larsson 1992*, 119f). This house (I) was at least 33 by 5.5m, and the rounded form of the south-east end wall could be clearly documented along with five large central posts which yielded late Neolithic pottery as well as characteristic arrowheads. Two radiocarbon dates place this settlement at the transition between the late Neolithic and early Bronze Age: between 1600 and 1500 BC (*L.*

Larsson 1992, 120).

In the mid-1990s one of the largest settlement sites in Sweden was excavated at Pryssgården (Norrköping) in Östergötland, eastern central Sweden (Borna 2002). One house is of special interest: House 153 was 32 by 6m and the only two-aisled house discovered during the excavations (Borna 2002, 28f). The end walls were rounded. A radiocarbon date indicates the transition to the early Bronze Age; 1686–1499 BC (Stålbom 1995). This house was located at the highest point and with the long sides facing Motala River. Further to the north a large number of houses were found during fieldwork in 2002 for a new highway north of Uppsala. At the site Kyrsta house 5 is similar to the houses of Piledal type. It was 32m long and 7.5m wide (Göthberg 2007).

To summarize, during the late Neolithic, settlement patterns and society were gradually changing from a diversified cultural picture to a more unified one. There were more settlements than before, and the number of houses of different types—longhouses of different types as well as pit houses—is large. At the end of the late Neolithic a new type of house emerged. This type could be called Piledal-type houses, after the site Piledal in south-eastern Scania. This type of very long building has sometimes been seen as emerging in conjunction with a new competitive society in which the control of metal was important (Björhem and Magnusson-Staaf 2006, 139).

DISCUSSION

During the earliest Neolithic TRB culture in south Scandinavia new regions inland were coming into use, whilst the old coastal midden sites were still used seasonally for hunting and fishing. The new settlements were preferably on sandy soils and in close proximity to fresh water. Already in the EN I people built longhouses of the Mossby type. The settlements have usually been seen as small, and interpreted as single farms. Evidence from new excavations challenges this presumption, however, and it is quite possible that the situation is much more complex. Along with the longhouses pit houses and different types of huts were also used. During the middle Neolithic (MN A) this pattern continued but the settlements increased in size and developed slight variations on the Mossby house type. There was also a change in the use of the landscape, with a marked concentration near the coast. At the same time the constructed of large megalithic monuments—passage graves—continued. During the middle part of the MN A there was, however, a clear change. The old settlement regions were largely less abandoned and new inland

regions were increasingly inhabited, whilst passage graves fell out of general use.

During the MN A the PWC was widespread in many parts of southern Scandinavia, especially in eastern central Sweden and along the Swedish east coast. The settlements differed significantly from the TRB settlements and as yet we have no evidence for longhouses of any kind. The settlements are generally large and made up of several more or less round/oval hut structures, sometimes also pit houses. At the end of MN A the evolution of the BAC and SGC in both south Sweden and Denmark saw a cultural change towards single graves, often placed in cemeteries. Settlements were still few but the evidence that we have points to a continuation of the same house types that were in use in the TRB culture. As far as we can tell the sites were small and dispersed.

During the late Neolithic we can see an expansion in the areas of the landscape used for settlement, and new regions were settled as indicated by the construction of a large number of gallery graves in the central parts of southern Sweden. It is also from the late Neolithic that a really large number of houses of different types were built. Characteristic is the two-aisled longhouse, sometimes over 30m long, but mostly c. 12–20m long. It is also the first time that we can confirm that a couple of farms were erected contemporaneously at the same settlement, and used for a long time. Together with longhouses there were also late Neolithic pit houses of different types.

NOTE

1. All radiocarbon dates in the text are calibrated.

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Subsistence and Social Routine

CHAPTER 19

STABLE ISOTOPES AND NEOLITHIC SUBSISTENCE

Pattern and Variation

RICK SCHULTING

INTRODUCTION

THE role of the subsistence economy in defining the ‘Neolithic’ ranges from central to epiphenomenal in the thinking of various scholars and national traditions. In western Europe, the Neolithic is often defined as the shift to an economy dominated by domesticated plants and animals. In eastern Europe, on the other hand, it involves above all the appearance of pottery. For some scholars, it is a state of mind. Since the definition of the term itself varies, it is not surprising that subsistence evidence also varies widely across Europe. Despite this, the study of ‘Neolithic’ subsistence remains of great interest, since making a living affects so much of people’s day-to-day activities. Biomolecular approaches to the investigation of past human diet are becoming increasingly important, not least in the characterization of European Neolithic diets, where stable carbon and nitrogen isotope analysis has played a pivotal role in challenging notions of a gradual uptake of domesticated resources. More recently, stable isotope analysis has also been used to challenge the idea of dietary homogeneity across Europe, of a single Neolithic way of life. This chapter presents an overview of the state of play, and raises some cautions regarding the interpretation of finer-scale regional variation in isotopic data.

One cannot hope to cover all of Europe adequately in an overview of this kind. Instead, I focus on a number of regions to highlight themes, and on selected areas that can be used to address both similarities and differences ([Fig. 19.1](#)). The question of scale will be crucial. To expect similar subsistence practices from the Mediterranean to northern Scandinavia would clearly be untenable—even before considering different culture histories—given the varying

climates, soils, and native fauna and flora, and the diverse possibilities and challenges these present to growing cereals and keeping livestock. On the other hand, one of the characteristics of the relatively restricted number of domesticated plants and animals that have expanded with humans to cover huge parts of the globe is their adaptability (Bellwood 2005). Consider where wheat and barley are grown today, and where cattle, sheep, goats, and pigs are kept, and it is apparent that they are subject to few strictly environmental limitations. But it is the detail that matters here, the particular ways in which cereals are grown and animals are kept, the varying proportions of domestic species, the contribution of wild plants and animals, and how these decisions impact on the routines of individuals and communities.



FIG. 19.1. Map showing locations of key sites.

STABLE ISOTOPES

The two stable isotopes of central importance for studying diet are carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$). Most studies have focused on bone and tooth (dentine) collagen, which provide information primarily on the protein component of the diet (Ambrose and Norr 1993; Tieszen and Fagre 1993; Jim et al. 2006). This is a point worth emphasizing, since this means the two other principal components of food—carbohydrates and lipids—will be under-represented, the more so in high-protein diets. Bioapatite, the mineral component of bone, does reflect the whole diet, but is more subject to diagenesis, and so is less used (though see Papathanasiou 2003). This is an area that could certainly benefit from further exploration in the European Neolithic. The other crucial point is that measurements on adult human bone collagen represent protein consumed during approximately the last decade of a person's life. However, the question of carbon and nitrogen turnover in bone is far more complex than this: different bones, for example, can exhibit different turnover rates, and an individual's age and nutritional status are additional factors. But the main point for present purposes is that we are not measuring short-term variation, such as seasonal changes in diet or the last year of a person's life, which may have a greater chance of being atypical. Teeth present an exception, as there is negligible turnover in dentine once it is formed in childhood. They therefore 'lock in' a dietary signal from the time that tooth was developing; this itself varies from tooth to tooth, and so allows us to trace dietary changes through childhood and early adolescence (Eriksson 2004; Sealy et al. 1995).

In Europe, stable isotope analysis, especially $\delta^{13}\text{C}$, has undoubtedly been most effective in coastal areas, because it differentiates clearly between marine and terrestrial protein sources. For $\delta^{13}\text{C}$, typical values for marine organisms' bone collagen are $-12 \pm 1\text{‰}$, whilst those of most terrestrial organisms' bone collagen in C_3 systems are $-21 \pm 1\text{‰}$ (C_4 plants, such as millet, complicate the picture, but do not feature significantly in Neolithic Europe and so are not considered here). These endpoints are crucial to interpreting human bone collagen measurements, and any local variation in their values can greatly affect conclusions. This is especially relevant in the Baltic Sea, for example, where $\delta^{13}\text{C}$ values of marine organisms vary considerably through space and time, depending on the degree of water flow between the Baltic and North Seas. Freshwater systems can also vary quite widely, with some having elevated values and others exhibiting values more depleted than in most terrestrial systems (Dufour et al. 1999).

Stable nitrogen isotopes for the most part reflect trophic level, though there are a number of other factors (Hedges and Reynard 2007). Because aquatic (both marine and freshwater) food chains are

usually far longer than terrestrial ones, $\delta^{15}\text{N}$ values of top predators (e.g. seals) will typically be considerably higher than is possible for terrestrial mammalian carnivores. There can be considerable variation in $\delta^{15}\text{N}$ values, but on average the bone collagen of adult terrestrial herbivores in Europe ranges between 4‰ and 6‰, leading to values 3–5‰ higher in predators. Young animals still nursing, or recently weaned, have higher values than their mothers, by as much as 3‰. Their consumption would have an impact on human diets, though their low body mass would limit the importance of this resource. Herbivore values themselves depend primarily on the values of the plants consumed, which can also vary widely, though this variation tends to be averaged out by the long-term diet reflected in bone collagen.

One of the interesting points to emerge recently is the extent to which manuring crops with animal dung can increase their $\delta^{15}\text{N}$ values (Bogaard et al. 2007). Experiments show that this enrichment can easily be on the order of a full trophic level. Thus, the high nitrogen isotope values that often characterize Neolithic humans, interpreted as indicating diets high in animal protein (meat and/or dairy products) (e.g. Richards 2000), could equally come about by consuming intensively manured crops, or a combination of cereals and animal protein. This has clear implications for the nature of early farming practices and landscape use. A manuring signal can be retained in charred Neolithic cereal grains through elevated $\delta^{15}\text{N}$ values, so it should be possible to investigate the practice and identify any spatial and temporal variability, though in practice this has turned out to be less than straightforward (Fraser et al. 2011). Another possibility involves naturally elevated $\delta^{15}\text{N}$ values in wetland habitats, as proposed by Britton et al. (2008). Equally, however, aridity has been found to have the same effect (Amundson et al. 2003). Whilst the latter would not be a factor in temperate Europe, it could affect the interpretation of values in the Mediterranean, particularly dry regions such as central Spain. More subtle environmental factors have also been found to be relevant (Hedges et al. 2013).

A further complicating factor arises from the consumption of nitrogen-fixing plants, such as lentils and peas. These leguminous species can exhibit very low $\delta^{15}\text{N}$ values, since they can fix nitrogen directly from the air, rather than from nitrates in the soil (leading to values of around 0‰, that is equivalent to the AIR (Ambient Inhalable Reservoir) standard used in calculating $\delta^{15}\text{N}$ ratios) (Fraser et al. 2011). Considering all the possible sources of variation in $\delta^{15}\text{N}$ values, there is clearly the potential for the problem of equifinality, and interpretation must take into account other sources of information,

including above all archaeobotanical and zooarchaeological findings from the site/culture in question. Legumes, for example, will primarily affect human values around the Mediterranean, as they were far less important further north (Colledge and Connolly 2007). The consumption of freshwater fish can lead to elevated values in human consumers, and this possibility also needs to be considered. The dietary use of marine shellfish, fish, and mammals is usually visible in elevated $\delta^{13}\text{C}$ values, and so presents less of an interpretive problem.

ATLANTIC EUROPE: A STRONG PATTERN AND SOME EXCEPTIONS

The first application of stable isotope analysis (specifically $\delta^{13}\text{C}$) in Europe was Tauber's (1981, 1986) observation of a seemingly rapid shift from the use of marine to terrestrial resources in Denmark, coinciding with the appearance of the Neolithic at c. 3900 cal. BC. This pattern remains striking, though it has become clear that the situation may be more complex, and that shellfish and fish, including freshwater species, still contributed to the diet, though a clear shift away from marine protein remains supported (Fischer et al. 2007; Price et al. 2007).

Subsequent studies in several areas along the Atlantic façade have shown that the Danish pattern is not unique. In Portugal (Lubell et al. 1994), Spain (Arias 2005), Brittany (Schulting and Richards 2001; Schulting 2005), Wales (Schulting and Richards 2002a; Schulting et al. 2013), Ireland (Schulting et al. 2012; Woodman 2004), and Scotland (Richards and Sheridan 2000; Schulting and Richards 2002b, 2009; Schulting et al. 2010) a similar marked shift from marine to terrestrial isotopic signatures appears to coincide with the Mesolithic–Neolithic transition. In all these cases, coastal Mesolithic populations exhibit moderate to high use of marine resources (approaching 100% of the protein consumed in the case of Oronsay in western Scotland, with human values similar to those of seals and sea otters), whilst Neolithic populations in the same regions show little or none. This is not to say that marine foods were never consumed by Neolithic communities, as the resolution of the technique is insufficient to identify the consumption of small amounts (5–10%) of marine protein *on an individual basis*. However, given adequate sample sizes, a comparison of coastal and inland groups should detect differences of this order. Unfortunately, such samples are not always available: survival of bone is rare to non-existent in inland Brittany and Scotland, for example. But at present, in England and Wales at least, no significant differences can be detected in the isotopic signatures of

individuals from coastal (within 5km) and inland sites, strongly suggesting that marine protein really did not feature significantly in the diets of coastal populations here (Richards et al. 2003; Richards and Schulting 2006; Schulting 2011, 2013).

As pointed out by Thomas (2003, 2004; see also Milner et al. 2004), that Neolithic individuals in Britain show a terrestrial isotopic signature does not in and of itself indicate that this resulted from the consumption of domesticated resources, since wild terrestrial plants and animals would give similar, if not indistinguishable, values. However, when other lines of evidence are brought to bear, it is clear that domestic animals overwhelmingly dominate *all* Neolithic faunal assemblages throughout Britain, from both ceremonial contexts and settlements (Schulting 2008, 2013). Perhaps most tellingly, this includes the earliest Neolithic site in Orkney with surviving faunal remains, the settlement at Knap of Howar (Ritchie 1983; Tresset 2003), dating to c. 3600 BC, only a few centuries later than the initial appearance of the Neolithic in southern England.

Located near Knap of Howar (and possibly representing the burial place for at least some members of that community), the chambered tomb of Holm of Papa Westray North presents an interesting variation on the farming theme. Humans here show slightly but significantly elevated $\delta^{13}\text{C}$ values compared with Neolithic humans from other Scottish coastal sites (Schulting and Richards 2009; Schulting et al. 2010). As noted above, the mammalian fauna at the nearby and contemporary settlement is completely dominated by domestic fauna. A few seals are present, as are shellfish and fish remains. Whilst a small amount of fish could well account for the observed human values, an intriguing alternative presents itself. During AMS ^{14}C dating of animal remains from the tomb, two neonatal lambs presented extremely elevated $\delta^{13}\text{C}$ values, indicating that their mothers must have consumed seaweed (and little else) in the months prior to lambing (Balasse et al. 2006; Schulting et al. 2004). Only slightly elevated values were found in adult sheep, so that, unlike on modern North Ronaldsay, where sheep eat seaweed year-round (Ambers 1990), the animals must have usually grazed on pasture. Young lambs would quickly develop typical terrestrial $\delta^{13}\text{C}$ values once they began to consume grass, but because of the relatively slow turnover rates in bone (even for young animals), they would have retained an elevated signal for some months. Thus the consumption of such animals, most probably males culled before winter, would present another way in which humans could *indirectly* acquire a slight 'marine' isotopic signal (though flesh turnover would be quicker, so that the full effect would only be seen with the consumption of very young animals).

Whilst the broad pattern of the shift away from marine resources in

the Neolithic is striking and widespread, it is not unvarying across Europe. Even for the areas discussed above, sample sizes are often so small that the results can be viewed as provisional, though their consistency permits a fair degree of confidence. One of the more striking departures from this pattern comes from eastern Sweden, where a strong reliance on marine resources is documented at the Middle Neolithic B (c. 2800 BC) sites of Västernbys and Ajvide on Gotland (Eriksson 2004; Lidén et al. 2004; Lindqvist and Possnert 1997), and at Korsnäs, at the time a small island on the east central coast (Fornander et al. 2008) (Fig. 19.1). Whilst domestic animals are present, human $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values are both very elevated, suggesting a reliance on seals. The sites belong to the Pitted Ware culture (PWC), which shows a strong coastal orientation, with faunal assemblages also supporting the importance of sealing. Thus, there is little indication that these groups were committed to a farming way of life. This is also the case further north and east into the Baltic, where the uptake of farming was much more gradual and incomplete (see Bartosiewicz and Lillie, this volume). This begs the question of how we define the 'Neolithic': if based on a farming economy, then the PWC would not qualify, but of course this quickly becomes a pointless tautological exercise. What we label these societies is less important than understanding them, and in turn the variation that existed across Europe during the sixth to third millennia BC.

What makes the PWC in eastern Sweden particularly interesting is its coexistence with the distinct Neolithic Funnel Beaker (TRB) farming culture. Individuals from the TRB passage grave of Resmo on the island of Öland exhibit very different isotopic results, indicating far less use of marine resources (Lidén 1995), though still more than usually seen along the Atlantic façade. Further north on Öland, another Pitted Ware site, Köpingsvik, again shows elevated isotope values suggesting a focus on seals: human isotope values from the two sites are, with a single exception, completely non-overlapping (Eriksson et al. 2008) (Fig. 19.2). Thus, it is clear that the focus on sealing by Pitted Ware groups was not a matter of necessity, but of choice, though likely subject to rather different conditions than found further west in the Baltic, or along the Atlantic façade. Farming, whilst still possible, may have been less attractive given the shorter growing season at higher latitudes, the increased distance (in the Baltic) from the warming influence of the North Atlantic Drift (the Gulf Stream), and, crucially, the availability of viable alternatives. Sjögren's (2003, 170–171) comment that Funnel Beaker farmers on the Swedish west coast (with terrestrial isotopic signatures from the passage grave of Hunnebostrand) chose this way of life *despite* the rather unfavourable environmental circumstances, as a marker of

cultural identity, makes the point well. In addition to having different diets and lifeways, recent aDNA findings suggest that PWC and TRB groups in Sweden were also genetically distinct populations ([Malmström et al. 2009](#)).

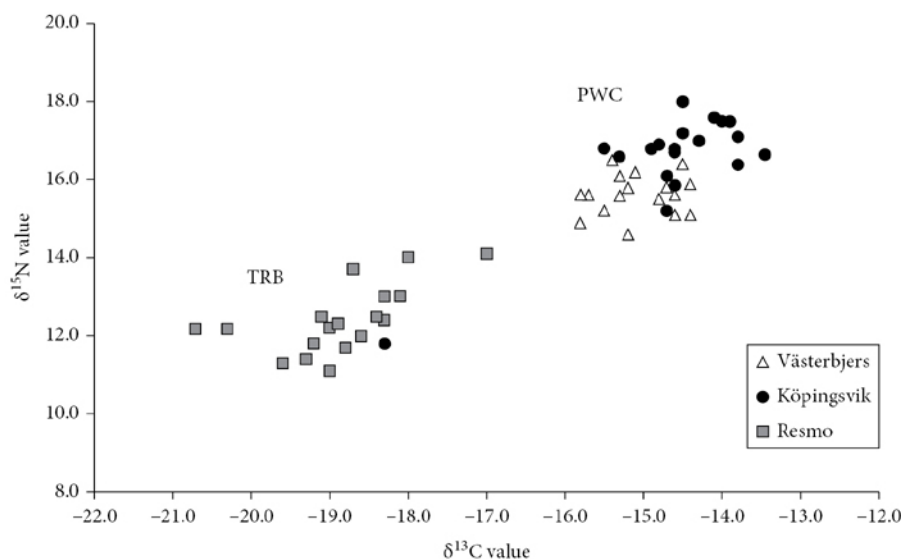


FIG. 19.2. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values on human bone collagen from Neolithic sites in eastern Sweden. Västerbjers and Köpingsvik are Pitted Ware culture cemeteries, and Resmo is a Funnel Beaker (TRB) passage tomb. The single outlying datapoint from Köpingsvik is on a tooth (no bone measurement is available), clearly indicating that this individual originated in a group with a very different diet.

(data from [Eriksson 2004](#) and [Eriksson et al. 2008](#)).

The Netherlands provide a rather different picture to that found elsewhere along the Atlantic façade, with a seemingly more gradual and piecemeal adoption of the Neolithic way of life. Human stable isotope data are currently only available from three sites, but these span the transition: Hardinxveld (Mesolithic, c. 5450–4500 BC), Swifterbant (transitional, c. 4200–4000 BC), and Schipluiden (middle Neolithic, c. 3600–3400 BC) ([Smits et al. 2010](#)). Whilst the earlier groups show no clear evidence in their $\delta^{13}\text{C}$ values for any consumption of marine protein ([Louwe-Kooijmans 2007](#); [Smits and van der Plicht 2009](#)), they do show significantly elevated $\delta^{15}\text{N}$ values indicating the consumption of freshwater aquatic resources (fish and waterfowl). This is not particularly surprising, since the coastline around the low-lying Rhine–Meuse delta would not have been conducive to the exploitation of open-water marine species in either period. Moreover, Hardinxveld and Swifterbant are some 40–50km back from their contemporary coastlines. The extensive brackish and

freshwater marshes behind the coastal barriers offered a rich habitat, but one with predominantly ‘terrestrial’ $\delta^{13}\text{C}$ values. Domestic animal remains first appear in small numbers from c. 4500 BC, with evidence of cereals perhaps slightly later. The suitability of this low-lying region for growing cereals and keeping animals is debated (Bakels 2000; Bakels and Zeiler 2005; Cappers and Raemaekers 2008; Louwe-Kooijmans 2007); the highest land would be provided by clay levees and well-drained—but not particularly fertile—sand dunes that formed the focus of lowland occupation. Nevertheless, Cappers and Raemaekers (2008) argue that cereals were being grown here by the transitional Swifterbant culture. Another point of contention is the relationship between lowland and ‘upland’ sites, particularly once domesticates are attested in the latter: are these specialized seasonal camps of farmers based in the uplands, or are they the seasonal camps (none appear to be occupied year-round) of those following a hunting and gathering lifestyle, albeit with some use of domestic crops and animals?

Perhaps the most interesting stable isotope results are those from Schipluiden, a permanent settlement immediately behind the coast dune barriers, only some 3km from the contemporary coastline. The $\delta^{15}\text{N}$ values are as high as those from late Mesolithic Hardinxveld, with highly variable but on average slightly elevated $\delta^{13}\text{C}$ values ($-18.8 \pm 1.7\text{‰}$), suggesting some component of marine protein, but, more importantly, the significant consumption of freshwater fish and waterfowl. One individual in particular demonstrates high marine consumption (Smits et al. 2010). It seems that the community at Schipluiden was practising a broad spectrum economy very different from that of more committed farmers further inland (Louwe-Kooijmans 2007), yet the large mammalian fauna is still dominated by domestic species (c. 60%), particularly cattle (Louwe-Kooijmans 2009, fig. 10). Located only c. 1km from Schipluiden, the contemporary site of Rijswijk presents a mixed farming economy with over 95% domestic fauna (Louwe-Kooijmans 2009, fig. 12). Unfortunately, no stable isotope data are available, but the close proximity of the two sites must raise questions concerning the relationship between them, as well as between these near-coastal communities, and the farming communities found further inland.

THE MEDITERRANEAN

Relatively few stable isotope studies have been undertaken in the Mediterranean region, though this is changing rapidly. Mesolithic populations here appear to have made considerably less use of marine

resources than in Atlantic Europe (Salazar-García et al. 2014), whilst Neolithic populations do not differ substantially from those further north (it should be noted that the $\delta^{13}\text{C}$ terrestrial endpoint tends to be 1–2‰ higher in southern Europe, so that direct comparisons between the two areas are misleading; van Klinken et al. 2000). The earliest site to be considered here is Khirokitia, Cyprus, dating to the seventh/sixth millennium BC and located 6km from the coast. Preservation of human bone collagen was poor, but no samples showed any evidence of marine protein (Lange-Badré and Le Mort 1998). Further west, the sixth/fifth millennium BC Neolithic sites of Pendimoun (Alpes-Maritimes, France) and Arene Candide (Liguria, Italy) near the coast again show no appreciable use of marine protein (Le Bras-Goude et al. 2006). A series of late Neolithic samples from Brochtorff Circle on Malta, spanning c. 4200–2700 BC, could be interpreted as showing some small contribution of marine foods, certainly more than the above sites, though not as much as could be expected given the small size of this island and its rocky soils (Richards et al. 2001). The inland Chasséen (c. 4300–4000 BC) site of Le Crès, Hérault, is located 24km from the present French Mediterranean coastline. Some marine molluscs are present, but isotopic analyses indicate a terrestrial diet; that this is based on domesticated resources is confirmed by the exclusively domestic faunal assemblage and by the presence of wheat and barley (Le Bras-Goude et al. 2009). From southern Italy, three individuals from the Neolithic coastal site of Samari are slightly elevated in $\delta^{13}\text{C}$ compared with five early/middle Neolithic individuals from four inland sites (–19.2‰ vs. –19.9‰), but interpretation of this as indicating some use of marine foods is complicated by the fact that $\delta^{15}\text{N}$ values do not show a similar increase (data from Giorgi et al. 2005). Nevertheless, it is possible that low trophic level marine foods such as shellfish made a small contribution to the diet at Samari.

One of the most interesting Mediterranean studies comes from Greece, where Papathanasiou (2003) compares three coastal and three inland sites (Fig. 19.1). In contrast to Britain, the combined coastal sites exhibit slightly but significantly elevated values compared with the inland sites, suggesting a small contribution of marine protein at the former. However, the picture is more complicated, since one of the coastal sites, Aleoptrypa, actually groups with the inland sites and indeed has the lowest $\delta^{15}\text{N}$ values of all sites (Fig. 19.3), pointing to significant regional variation. This may be the result of the greater consumption of legumes.

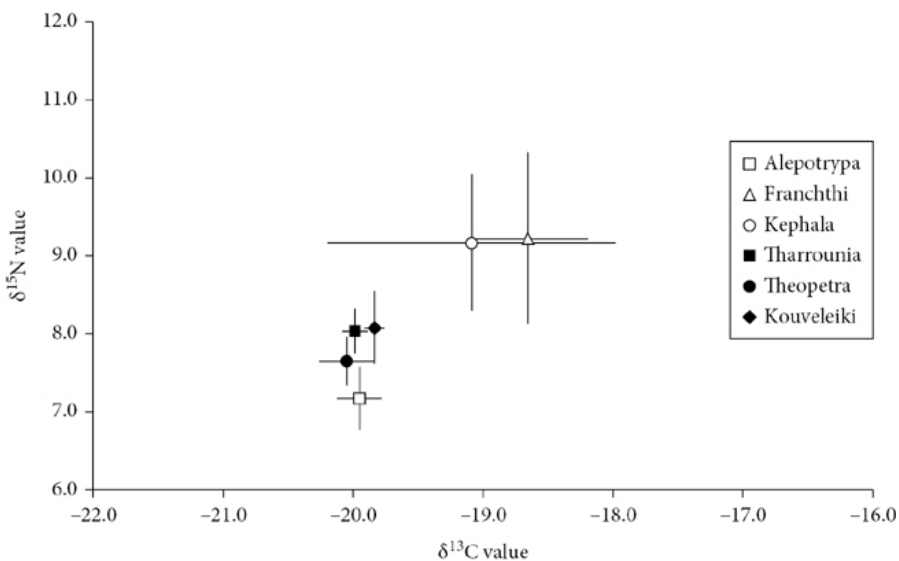


FIG. 19.3. $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values on human bone collagen from Neolithic sites in Greece. Open symbols are coastal sites, solid are inland. Note the grouping of coastal Alepotrypa with the inland sites. Error bars show two standard errors.

(data from [Papathanasiou 2003](#)).

Stable nitrogen isotope values from most of the Mediterranean sites discussed here tend to be low compared with those observed in north-west Europe, suggesting that the Mediterranean diet may have relied less on animal protein. For example, there is a shift ($\Delta^{15}\text{N}$) of only 1.6‰ in average $\delta^{15}\text{N}$ values between herbivores and humans at Le Crès ([Le Bras-Goude 2009](#)), which can be contrasted with an average difference of c. 5‰ at the inland site of Hazleton North ([Hedges et al. 2008](#)), a shift by no means atypical for Britain. The relatively high incidence of lactose intolerance in populations around much of the Mediterranean today is intriguing in this regard ([McCracken 1971](#)), and could suggest that milking was not as extensively practised in the Neolithic here as further north ([Copley et al. 2005](#)). Alternatively, as already mentioned, the consumption of legumes in the Mediterranean could lower human $\delta^{15}\text{N}$ values even if equivalent amounts of animal protein were being consumed ([Schulting and Hamilton 2012](#)). This again demonstrates the limitations of the stable isotope technique, and the need for a multidisciplinary approach.

INLAND LAKES AND RIVERS

Away from the coasts, stable carbon and nitrogen isotopes have offered fewer dietary insights: most terrestrial food options, wild and

domestic, exhibit variation that is at present too subtle to distinguish, though some intriguing possibilities are being explored (Lynch et al. 2008). As seen at Schipluiden, a notable exception is provided by communities living alongside and exploiting productive freshwater/estuarine ecosystems. These can be isotopically variable and complex, but elevated $\delta^{15}\text{N}$ values can provide an indication of the consumption of fish and/or waterfowl (sometimes, but not always combined with ‘unusual’—whether elevated or depressed— $\delta^{13}\text{C}$ values). The best documented examples are the Iron Gates region of the Danube, and the Dnieper Rapids of the Ukraine (see Bartosiewicz and Lillie, this volume, and references therein). In both cases there are only relatively small differences between Mesolithic and Neolithic isotopic results, though it must be borne in mind that ‘Neolithic’ contexts in the Ukraine are largely defined by the presence of pottery rather than by subsistence economy. Another notable example is Ostorf in northern Germany, a middle Neolithic cemetery in an area with abundant inland waterways that were clearly being exploited, given the high $\delta^{15}\text{N}$ average of $13.7 \pm 1.0\text{‰}$ (Lübke et al. 2007).

In most other parts of Europe, the importance of freshwater resources is more difficult to demonstrate. Whilst $\delta^{15}\text{N}$ values from Neolithic Britain, Ireland, and north-west France are relatively high (c. 9–11‰), they are not sufficiently elevated to suggest the significant consumption of freshwater fish, particularly given the other ways in which such values can be attained (e.g. manuring and/or use of wetland pastures) (Bogaard et al. 2007; Britton et al. 2008).

VARIATIONS ON A THEME

The above examples operate at a very broad scale, potentially glossing over local and regional variation in Neolithic diets. Given the problem of equifinality raised earlier, even isotopically identical diets can result from quite different combinations of domestic and wild plants and animals. This can be dealt with in part by measuring contemporary fauna from the same sites more systematically, and by considering other kinds of information—archaeological, archaeobotanical, zooarchaeological, palynological, osteological, etc.—that can shed further light on how people made their livings.

Less obviously, similar foodways can result in significantly different isotopic signatures, as would occur if animals grazed on plants with different isotopic values (some soils, for example, have higher $\delta^{15}\text{N}$ values, and hence so do plants and the herbivores reliant on them). Thus human consumers in one region might have elevated $\delta^{15}\text{N}$ values suggesting the consumption of a higher proportion of animal protein,

whereas in reality the diet may be identical to that in a region with lower $\delta^{15}\text{N}$ values. These are nuances that are only beginning to be appreciated; they come increasingly into play at the smaller scales of analysis that will begin to feature more strongly as the broad patterns are resolved.

A case study in southern England provides a useful illustration. [Richards \(2000, 2008\)](#) found that results from several approximately contemporary earlier Neolithic long barrows and chambered tombs exhibited slightly different isotopic values. This suggests that groups using different mortuary monuments, whilst all primarily farmers, consumed slightly different combinations of plants and animals. More variable results were noted for the large causewayed enclosure of Hambledon Hill, suggesting the presence of people drawn from surrounding communities, each with their variations on the farming theme. This is consistent with how these monuments are viewed, as built and used by a number of local communities. By contrast, individuals from the Hambledon Hill long barrow were suggested to show a narrower range of variation, suggesting they shared a more similar diet. This provides a very coherent and plausible account, and fits in with what we might expect of early farming communities. Similar local small-scale variation in cereal consumptions is also suggested by differences in dental caries rates at Pipton and Pen-y-wyrlod in south Wales ([Wysocki and Whittle 2000](#)).

But what has become appreciated recently is that faunal values from Neolithic sites in southern England also demonstrate a degree of inter-site variation, commensurate with that seen in humans, as demonstrated by the accumulating database of measurements on animals and humans from the same sites ([Hamilton and Hedges 2011; Hedges et al. 2007, 2008](#)) ([Fig. 19.4](#)). In other words, the isotopic differences between humans at different sites may relate to the consumption of the same proportions and types of domestic animals and plants, but with these themselves exhibiting slightly different isotope values (thus the humans from the Hambledon Hill enclosure may represent a coming together of groups from communities living in different environments but sharing similar subsistence patterns, though it should also be remarked here that the variability in the human isotopic data from Hambledon is actually no greater than that seen at a number of other sites). This is a difficult tangle to unravel, and demonstrates some of the difficulties of working at the small scale, though it should be possible to resolve some of these issues with adequate sample sizes and a well-designed research strategy.

A recent example of this approach comes from a study of three LBK sites in central Germany. Stable nitrogen isotope values for the adult humans differ only slightly between the sites: $8.4 \pm 0.5\text{‰}$ at

Halberstadt; $8.8 \pm 0.5\text{‰}$ at Derenburg; and $9.0 \pm 0.4\text{‰}$ at Karsdorf. Taken at face value, this suggests a similar reliance on animal protein. However, a comparison with domestic herbivore values from the same sites shows that the mean spacing between humans and herbivores ($\Delta^{15}\text{N}$) is only 1.6‰ at Derenburg, whereas it is 2.3‰ at nearby Halberstadt, less than 10km distant (Oelze et al. 2011, tab. 3), indicating surprisingly fine-scaled geographic variability. At a wider scale, as Oelze et al. note (2011, 277), $\Delta^{15}\text{N}$ values at all three sites are considerably lower than those seen in Neolithic Britain (e.g. c. 5‰ at Hazleton North), suggesting quite different farming practices with a greater emphasis on domestic animals in Britain. This does assume, probably legitimately, that the difference is not due to the significant consumption of legumes in Germany, where they are known to have been present (Bogaard 2004), versus their apparent absence in Britain (Jones and Rowley-Conwy 2007).

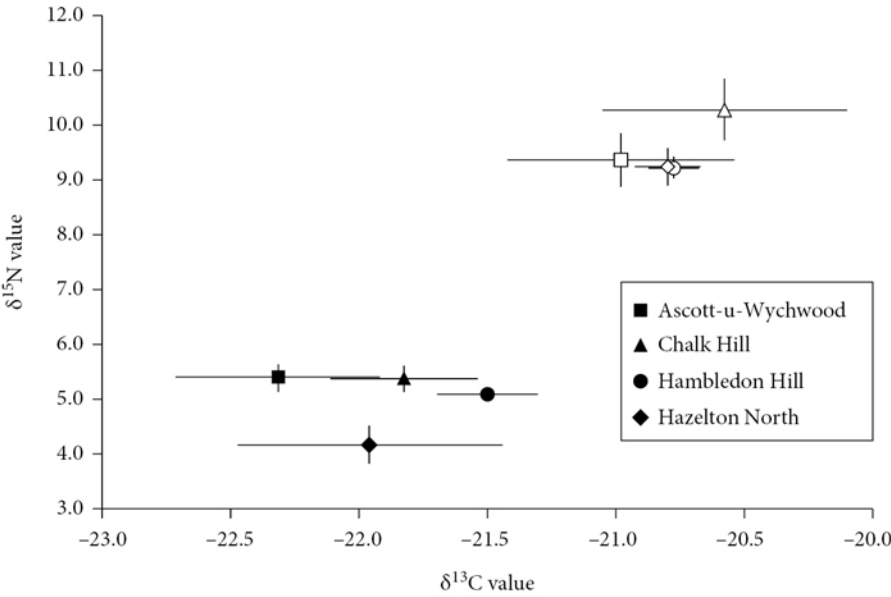


FIG. 19.4. Cattle (solid symbols) and human (open symbols) $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ results for selected earlier Neolithic sites in southern Britain (averages ± 2 SE) (data from Hamilton and Hedges 2011; Hedges et al. 2007; 2008; Richards 2008).

SEX- AND AGE-BASED DIFFERENCES IN DIET

The practice of communal burial in monuments across much of north-west Europe, leading to fragmentary and commingled remains, presents difficulties for the investigation of age- and gender-related

isotopic variability. Hence, much more data are available for central Europe, especially for the LBK, where the normative mortuary practice of individual interment greatly facilitates analysis. Many sites show no significant sex-based differences in either $\delta^{13}\text{C}$ or $\delta^{15}\text{N}$ values (Bickle et al. 2010; Dürrewächter et al. 2006; Hedges et al. 2013; Oelze et al. 2011). This is paralleled by results from elsewhere in Neolithic Europe, though these are generally based on small sample sizes (Le Bras-Goude et al. 2009; Lillie and Richards 2000; Richards 2008). However, a number of sites do show significant differences in $\delta^{15}\text{N}$, with males in all cases exhibiting the higher values (Table 19.1). This tendency is also seen in sites where the difference is not statistically significant. Some studies have suggested the existence of physiological differences in $\delta^{15}\text{N}$ between the sexes, relating to pregnancy (Fuller et al. 2004), whilst others have found no evidence for this effect in the long-term average represented by measurements on bone collagen (Nitsch et al. 2010). It seems more likely that the difference is indeed dietary, with males in general consuming slightly more animal-based protein. This receives some support in the tendency for LBK females to have slightly higher caries prevalence, possibly reflecting greater carbohydrate consumption (Hedges et al. 2013, 371). By contrast, only the LBK site of Ensisheim in Alsace, France, shows a significant difference in $\delta^{13}\text{C}$, with males having very slightly elevated values compared to females (Hedges et al. 2013). The source of this difference is not clear (the site being too far from the sea to reflect the consumption of marine protein).

Table 19.1 Average $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values on adult male and female human bone collagen from selected European Neolithic sites. NS = not significant.

Site	Region	Period	Female					Male					Mann-Whitney significance tests	Source
			$\delta^{13}\text{C}$	$\pm$	$\delta^{15}\text{N}$	$\pm$	n	$\delta^{13}\text{C}$	$\pm$	$\delta^{15}\text{N}$	$\pm$	n		
Balatonszárszó	Hungary	LBK	-19.9	0.2	9.5	0.5	16	-19.9	0.3	9.6	0.4	14	NS	Hedges et al. 2013
Füzesabony	Hungary	LBK	-19.8	0.1	10.2	0.3	3	-20.0	0.3	10.7	0.3	3	NS	Hedges et al. 2013
Polgár-Ferenci-hát	Hungary	LBK	-20.0	0.3	10.3	0.6	16	-19.9	0.3	10.3	0.7	17	NS	Hedges et al. 2013
Nitra	Moravia/Slovakia	LBK	-20.2	0.3	10.2	0.4	26	-20.1	0.2	10.5	0.4	14	$\delta^{15}\text{N}$, $p = 0.025$	Hedges et al. 2013
Vedrovice	Moravia/Slovakia	LBK	-19.7	0.3	9.5	0.4	34	-19.6	0.3	9.9	0.5	19	$\delta^{15}\text{N}$, $p = 0.001$	Hedges et al. 2013
Middle Elbe-Saale	Saxony-Anhalt	LBK	-19.9	0.3	8.6	0.7	32	-19.8	0.3	8.9	0.7	28	NS	Oelze et al. 2011
Schwetzingen	Baden-Württemberg	LBK	-20.2	0.2	8.9	0.6	52	-20.1	0.3	9.0	0.4	43	NS	Hedges et al. 2013
Heixheim	Rhineland-Palatinate	LBK	-20.0	0.3	9.8	1.0	8	-20.1	0.3	9.9	1.2	11	NS	Dürrewächter et al. 2006
Trebur	Hessen	MN	-19.8	0.3	9.4	0.5	20	-19.8	0.4	10.0	0.5	20	$\delta^{15}\text{N}$, $p < 0.00$	Dürrewächter et al. 2006
Altterhofen	Bavaria	LBK	-20.4	0.2	9.8	0.3	20	-20.4	0.3	9.9	0.4	27	NS	Bickle et al. 2010
Asparn	Austria	LBK	-19.6	0.2	9.1	0.3	6	-19.6	0.1	9.6	0.4	17	$\delta^{15}\text{N}$, $p = 0.021$	Hedges et al. 2013
Kleinhadshof	Austria	LBK	-19.8	0.4	9.5	0.4	10	-19.8	0.2	9.6	0.6	16	NS	Hedges et al. 2013
Rutzing	Austria	LBK	-20.5	0.2	9.3	0.9	3	-20.5	0.3	9.7	0.2	6	NS	Hedges et al. 2013
Ensisheim	Alsace, NE France	LBK	-20.3	0.5	9.2	0.4	15	-20.1	0.2	9.5	0.6	17	$\delta^{13}\text{C}$, $p = 0.036$	Hedges et al. 2013
Vendenheim	Alsace, NE France	LBK	-20.2	0.2	10.0	1.5	2	-20.1	0.2	10.9	0.3	7	NS	Hedges et al. 2013

Le Cr�s	France	EN	-19.3	0.7	8.3	1.1	8	-19.4	0.3	8.4	0.7	4	NS	Le Bras-Goude et al. 2009
Garonne sites	France	MN	-20.4	0.3	10.0	1.3	6	-20.8	0.2	9.8	0.7	6	NS	Herrscher and Le Bras-Goude 2010
Coldrum	Kent, England	EN	-20.9	0.3	10.5	0.8	6	-20.7	0.2	10.5	0.7	8	NS	Wysocki et al. 2013
Hambledon Hill	Dorset, England	EN	-20.9	0.3	9.5	0.9	8	-20.6	0.3	9.0	0.8	15	NS	Richards 2008
Hazleton North	Glos, England	EN	-20.6	0.6	9.6	0.1	2	-20.7	0.1	9.3	0.8	5	NS	Hedges et al. 2008
Hay Wood Cave	Somerset, England	EN	-20.0	0.3	10.0	0.5	3	-20.4	0.2	10.1	0.1	3	NS	Schulting et al. 2013
V�sterbjers	Gotland, Sweden	MN	-15.2	0.5	15.3	0.2	9	-15.1	0.5	15.8	0.3	9	$\delta^{15}\text{N}$, $p = 0.07$	Eriksson 2004

The Pitted Ware site of V sterbjers, introduced above, provides a rare opportunity to explore the life history of sex-based dietary differences. No differences were observed in $\delta^{13}\text{C}$ values for nine females and nine males, though slightly higher $\delta^{15}\text{N}$ values for males approach the 0.05 level of statistical significance (Eriksson 2004, 147). Interestingly, no comparable difference is seen in $\delta^{15}\text{N}$ dentine measurements on molar teeth from the same individuals, indicating that any distinction, tentative as it is, only appeared with adulthood.

Age-based differences are more commonly seen, with infants exhibiting elevated $\delta^{15}\text{N}$ values due to the nursing effect (Schurr 1998). Regional and chronological variation in weaning practices has important implications for fertility, and hence for population growth (Bocquet-Appel 2002; Bocquet-Appel 2012), but too few studies on European Neolithic material have been undertaken at sufficient resolution to discuss this meaningfully.

CONCLUSIONS

Foodways refer to more than simply ‘diet’. How people obtained their food, managed crops, and kept animals and what wild foods they gathered or hunted, whilst not determining, have strong implications for daily and seasonal routines, how people moved around and perceived their landscape, the sizes and longevity of communities (and hence the intensity of social interaction), and myriad other aspects of their lives. Was transhumance practised, and if so by which subset/s of the community, and how did this affect social relations (cf. Bentley et al. 2003; Whittle 1997)? How often were domestic animals consumed, and how common was milking? Was cereal cultivation extensive or intensive? Were plots long- or short-lived, and how did this affect people’s sense of place (cf. Bogaard 2004)? Much of this potential is only beginning to be realized.

The main impact of dietary stable isotope studies in European prehistory has undoubtedly been in demonstrating a remarkable and widespread—though not universal—shift away from marine resources from the beginning of the Neolithic. The exceptions are also interesting, with eastern Sweden for instance providing insights into

the very different economic adaptations of two contemporary groups, and strongly supporting their identification as distinct cultures with differing lifeways. The emphasis on coastal situations is largely biased by the method's efficacy in distinguishing marine and terrestrial sources of protein. Dealing with inland situations is far more difficult, though a few areas offer the opportunity to compare Mesolithic and Neolithic diets, particularly the Iron Gates and the Dnieper Rapids, but these areas are unusual in terms of their ecological settings. New studies from the Netherlands have also been useful in demonstrating the degree of variability between Neolithic communities, highlighting the possibility of specialized wetland adaptations.

Less attention has been paid to isotopic shifts within the Neolithic, though in most situations detecting these will be more challenging (cf. [Schulting et al. 2010](#)), unless they involve, as in parts of Scandinavia, coastal groups with differing commitments to farming. Of equal interest to community-level variability is within-group variation, whether based on gender, age, activity, or status distinctions. Few studies have yet addressed these issues, but their potential is clear, provided that samples of sufficient size are available. At the same time, whilst powerful, isotopic studies are clearly limited in many ways. It is thus important to compare stable isotope results with palaeopathological analysis (such as dental caries rates), and with palaeobotanical, zooarchaeological, and artefactual studies to obtain a fuller picture of Neolithic subsistence and social routines.

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CHAPTER 20

SUBSISTENCE PRACTICES AND SOCIAL ROUTINE IN NEOLITHIC SOUTHERN EUROPE*

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INTRODUCTION

‘SUBSISTENCE’ practices in Neolithic Europe are often subordinated to debate over the agents of Neolithization. This debate equates migrating farmers versus acculturated foragers with rapid versus gradual establishment of farming, a packaged versus piecemeal Neolithic, and ‘economic’ versus ‘ideological’ underpinnings of subsistence change. Framing subsistence as a reflection of origins, however, ignores its potential for inferring the *consequences* of Neolithization, which are both more significant for understanding long-term social development and more accessible archaeologically. Whilst farmer origins can only be resolved through ancient human DNA, the rhythms, taskscapes, and sociality of subsistence practice offer rich insights into the construction and development of Neolithic societies and social identities.

This chapter explores Neolithic subsistence practices, land use, and landscape transformation in southern Europe, using relevant datasets such as human skeletal remains for diet, and plant and animal remains for husbandry practices. Because of regional differences in archaeological evidence, formation processes, and research priorities, we focus first on south-east (Greece and the north Balkans—[Fig. 20.1](#)) and then south-west Europe (from Dalmatia, through Italy and southern France to Iberia—[Fig. 20.2](#)). We conclude by considering what light subsistence practices may shed on social routines at various temporal and spatial scales.



FIG. 20.1. Sites in south-east Europe mentioned in the text.

1, Kalythies; 2, Knossos; 3, Alepotrypa; 4, Kouveleiki; 5, Franchthi; 6, Kastria; 7, Zas; 8, Kefala; 9, Kitsos; 10, Skoteini; 11, Theopetra; 12, Youra/Cyclops cave; 13, Makriyalos; 14, Paliambela-Kolindrou; 15, Stavroupoli; 16, Anza; 17, Kovacevo; 18, Slatina; 19, Blagotin; 20, Divostin; 21, Selevac; 22, Vinča; 23, Starčevo; 24, LepenskiVir; 25, Ecsefalva; 26, Méhtelek-Nádas; 27, Polgár-Csőszhalom; 28, Schela Cladovei; 29, Măgura-Buduiasca; 30, Poduri.



FIG. 20.2. Sites in south-west Europe mentioned in the text.

1, Grapceva; 2, Danilo; 3, Prokovnik; 4, Bukovic; 5, Tinj-Podlivade; 6, Nin; 7, Pupicina; 8, Mala Triglavca; 9, Ciclame; 10, Zingari; 11, Edera; 12, Mitreo; 13, Nogaredo al Torre; 14, Sammardenchia; 15, Piancada; 16, Molino Casarotto; 17, Lugo di Romagna; 18, Neto-Via Verga; 19, La Marmotta; 20, Villaggio Leopardi; 21, Masseria di Gioia; 22, Mulino Sant'Antonio; 23, Passo di Corvo; 24, Scaloria; 25, Santa Tecchia; 26, Rendina; 27, Ipogeo Manfredi; 28, Torre Sabea; 29, Grotta della Madonna; 30, Grotta del Cavallo; 31, Grotta dell'Uzzo; 32, Grotta del Genovese; 33, Arene Candide; 34, Sion Planta; 35, Clairvaux Station III; 36, La Balme de Thuy; 37, Le Chenet des Pierres; 38, La Grande Rivoire; 39, Pendimoun; 40, Fontbrégoua; 41, Baume Ronze; 42, Baume d'Oulen; 43, Combe Obscure; 44, Roucadour; 45, Portiragnes; 46, Abeurador; 47, Grotte Gazel; 48, Font Juvénal; 49, Bélesta; 50, Dourgne; 51, Pico Ramos; 52, El Mirón; 53, La Vaquera; 54, La Revilla del Campo; 55, La Lámpara; 56, Chaves; 57, Bauma Serrat del Pont; 58, Cova 120; 59, La Draga; 60, Camí de Can Grau; 61, Cova Fosca; 62, Ereta del Pedregal; 63, Cova de la Sarsa; 64, Arenal de la Costa; 65, Jovades; 66, Mas d'Is; 67, Niuët; 68, Cova del Or; 69, Cova de las Cendres; 70, Cerro de la Virgen; 71, Nerja; 72, Cueva del Toro; 73, Cueva de los Murciélagos; 74, Valencina de la Concepción; 75, Zambujal.

Food remains on late Mesolithic sites across this large area indicate hunting of indigenous mammals (e.g. red deer, boar), fishing and shellfish-gathering (near coasts, lakes, and rivers), and collecting of nuts, fruits, and seeds. Occasional claims of domesticates in Mesolithic levels of caves or rock shelters (e.g. Cyclops and Theopetra, Greece; Abeurador, Fontbrégoua, Dourgne, and Gazel, France; Costa, Spain) appear to be based on misidentification or stratigraphic mixing. At most early Neolithic sites, especially in south-east Europe, bones of domestic sheep, goats, pigs, and cattle predominate alongside cereal and pulse grains; most, if not all, of these domesticates were introduced from south-west Asia. Human skeletal evidence for diet and nutritional health (e.g. [Bonsall et al. 2004](#); [Le Bras-Goude et al.](#)

2006; Papathanasiou 2003; Triantaphyllou 2001) offers a coarser, but consistent, picture of radical change in human diet between the late Mesolithic and early Neolithic across much of southern Europe. This transition, in the seventh millennium BC in Greece and sixth millennium in the north Balkans and west Mediterranean, was rapid. Whether it occurred in any one region within a single human generation or over a few centuries is less clear, but apparent examples of *gradual* change from hunting to herding may again reflect stratigraphic mixing (Bernabeu et al. 2001). Because of the uneven availability of absolute dates, much of the discussion here of the subsequent three to four millennia of the Neolithic uses relative chronology: early (EN), middle (MN), late (LN), and perhaps final (FN) Neolithic. These phases do not have the same absolute dates across southern Europe, although EN usually refers to the first centuries following the Mesolithic–Neolithic transition.

MODELS AND METHODS

The nature of settlement constrains subsistence options: increasing community size *enlarges* the territory needed for subsistence, whilst sedentary behaviour *restricts* the area exploitable. Accordingly, large sedentary communities need locally concentrated, predictable resources, whilst small mobile groupings can exploit more dispersed, unpredictable options. In south-east Europe, EN sites, concentrated in fertile lowland basins, initially comprised just a few houses, but many developed into deeply stratified and densely inhabited settlement mounds or ‘tells’. These represent long-lived or repeatedly occupied ‘villages’ ranging from several tens to a few hundred inhabitants (Raczky, this volume). Other open sites with more unstable or dispersed residence sometimes developed into ‘flat-extended’ settlements covering tens of hectares, making contemporaneity of housing much harder to gauge; given their large area and short duration, these sites perhaps represent a distinctive form of ‘village’. In the later Neolithic, agriculturally marginal (arid and dissected) parts of southern Greece were colonized by short-lived open sites, often representing a ‘farmstead’ or ‘hamlet’ of one or a few households. In south-west Europe, EN settlements seemingly include equivalents of both small ‘farmsteads’/‘hamlets’ and larger ‘villages’, with the same contrasting implications for subsistence options (Skeates, this volume [ch. 41](#)).

Different types of site also shape the survival and contextual resolution of bioarchaeological evidence. Tells provide better conditions for bones and charred seeds than shallow open-air sites,

where seasonal wetting and drying affect deposits. Conversely, on shallow sites, pits and ditches cut into bedrock may combine good organic preservation with clearer contextual definition than is normal in complex tell deposits, although the latter more often preserve invaluable burnt occupation levels. In caves, stable temperatures aid organic preservation, but natural and cultural reworking may conflate deposits. Moreover, caves often had specialized functions (burial, stabling, storage), in contrast to open-air habitation sites. These differences are critical given that evidence for Neolithic settlement and subsistence is overwhelmingly derived from open-air sites in south-east Europe, but extensively from caves and rock shelters in the south-west. A further issue affecting archaeobotanical evidence is the predominance of *charred* preservation in southern Europe. At rare sites with charred *and* waterlogged preservation, charring clearly favours stored plant foods used year-round against those eaten in season. Rarity of charred wild plant foods implies that these were not stored staples, therefore, rather than that they were not consumed.

Models of prehistoric farming in southern Europe have often focused on two perceived characteristics of pre-mechanized farming: extensive cereal agriculture, with plough oxen and tilled fallow; and large seasonally transhumant herds of goats and especially sheep grazing lowland stubble and fallow fields in winter and mountain pastures in summer. These practices were shaped as much by historical contingencies (e.g. inequalitarian land tenure, urban markets), however, as by environmental constraints and technology. Whilst extensive farmers and large-scale herders specialized in ‘cash crops’ (wheat, olive oil, wool, cheese), smallholders practised more intensive, integrated husbandry of a variety of crops and animals, ploughing with cows and/or digging manually, engaging in labour-intensive weeding and cereal-pulse rotation, and producing food and raw materials primarily for domestic consumption. The following discussion explores whether Neolithic land use better matches the large-scale, extensive, specialized or small-scale, intensive, diversified end of this spectrum. Per unit of cultivated land or livestock, ‘intensive’ husbandry is associated with higher yields, but also higher labour inputs, such that ‘extensive’ husbandry on a large scale is the usual basis of *surplus* production. (Spring sowing of untilled lake or river margins has been claimed to achieve the ideal combination of *low inputs* and *high yields*, but recent, opportunistic cases of ‘floodplain cultivation’ resulted in frequent failures as well as occasional bumper harvests.) For domestic self-sufficiency, intensive cultivation on a modest scale is adequate, although animal husbandry is less productive per unit of land than crops so that only a large-scale, specialized herding regime would suffice as the mainstay of

subsistence.

On-site archaeobotanical data, from storage deposits and processing by-products, shed light on crop diversity, with implications for ecological and dietary stability, as well as social contexts and routines of consumption. Some crops are linked with particular management practices (e.g. labour-intensive pulses with small-scale cultivation), but most such associations relate to crop varieties rather than species and are of questionable relevance to the past. The ecological characteristics of arable weeds are a better guide to the nature and management of cultivation areas.

Neolithic livestock species have complementary ecological preferences and productive potential. Sheep, as specialist grazers, traditionally converted crop stubble and fallow weeds into manure, whilst goats, cattle, and pigs also browsed or rooted in woodland and scrub. Pigs produce most offspring, followed by goats, sheep, and finally cattle. Sheep and goats were milked more than cattle in southern Europe, whilst pigs especially provided non-dairy fat for cooking and preserving meat. Cattle provided draught: oxen (castrated males) for big landowners, and cows for smallholders. Finally, sheep wool and goat hair were woven into clothing, bedding, and sacks, though the 'hairy' coat of early sheep was less useful. A mixture of livestock species thus favours herd security and self-sufficiency in a range of products, but conflicting feeding requirements limit the number of animals that can be kept. Conversely, a single species reduces security and self-sufficiency, but facilitates maintenance of large herds and specialization in particular products.

The products offered by an animal also depend on age and sex. Culling patterns cannot demonstrate *actual use* for milk, meat, or wool/traction, but clarify *potential intensity* of use and can be tested against life history evidence: for example, stress-related pathologies in cattle limb bones may reflect use as draught animals. Species composition, mortality, and life history thus shed partial but complementary light on the methods and outcomes of animal management. Similarly, food residues in ceramics may demonstrate processing of milk and non-dairy adipose fat, but shed no light on intensity of use. Preservation (mainly waterlogged) of textile fibres and wooden yokes, wheels, or ploughs provides welcome additional detail, but is unusual in southern Europe. Dental microwear sheds broad light on diet, including perhaps the degree of grazing pressure, in the weeks before death. Diachronic changes in biometry and morphology reflect longer-term effects of management: for example, poor nutrition favours smaller body size and competition between adult males for mates the reverse.

Stable carbon and nitrogen isotope ratios in bone collagen and tooth

enamel provide *direct* evidence of human diet, albeit at coarse resolution (e.g. marine versus terrestrial). Attempts to identify terrestrial Neolithic diets as crop or animal-based are problematic since they depend on *local* isotopic signatures in animals *and* plants, and the latter are usually unknown. On-site traces of dung imply availability of ‘stall-manure’ for distribution and reveal where livestock were sheltered, whilst associated plant remains may shed more detailed light on animal diet than stable isotopes or dental microwear.

SOUTH-EAST EUROPE

Plant use and husbandry in south-east Europe

Most archaeobotanical evidence derives from open-air sites and is relatively extensive from Greece, the former Yugoslav Republic of Macedonia (FYROM), and Bulgaria. Despite variable sampling and recovery, crops clearly dominate most assemblages from the EN onwards; edible nuts, fruits, and other wild plants occur frequently, but usually at low levels, and evidence of storage is rare. Crops include several types of wheat (einkorn, emmer, free-threshing), barley (hulled, naked), and pulses (lentil, pea, grass pea, bitter vetch, chickpea), all represented by ‘storage’ finds in Bulgaria ([Marinova 2007](#)) and most likewise in Greece ([Halstead 1994](#)). In recent multi-site programmes of intensive sampling and recovery in Greece ([Valamoti 2004, 2005](#)) and Bulgaria ([Marinova 2006](#)), ‘flat’ sites with relatively thin occupation layers such as Kovacevo yielded lower densities of charred crop remains than tells with deep deposits. Differences in preservation conditions rather than commitment to agriculture have thus shaped much of the observed variability in archaeobotanical representation of crops.

Burnt houses with *in situ* stores suggest household production and consumption of a range of cereals and pulses. Bulgarian house stores such as those recovered at Slatina ([Marinova 2006](#)) suggest that mixed harvests of einkorn and emmer wheat were the dominant staple, stored as ears or spikelets (grains enclosed by chaff) requiring piecemeal dehusking. Harvesting of ears only has been inferred from the heights of weeds ([Kreuz et al. 2005](#); [Marinova and Thiébault 2008](#)). In such stores, pulses tend to account for 20–30% by volume relative to cereals—a high proportion compared with recent extensive agriculture.

Early Neolithic (Starčevo-Criș-Körös, sixth millennium BC)

settlements from Serbia, south-east Hungary, and southern Romania are predominantly 'flat-extended'. Published archaeobotanical data are sparse but include multiple cereals and pulses. For example, einkorn, emmer, barley (mostly hulled), lentil and pea, as well as wild Cornelian cherry, are known at several Starčevo sites (Borojević 2006, table 2.5). In Hungary, systematic flotation at Ecsefalva 23 has yielded einkorn, emmer, and barley, with traces of other cereals and lentil; collected wild plants included water chestnut, strawberry, and hazelnut (Bogaard et al. 2007). Elsewhere, evidence of Körös use of wild plants includes a layer of hazelnut shell in a pit at Méhtelek-Nádas (Gyulai 2007). In Romania, large-scale recovery at 'flat-extended' Măgura-Buduiasca yielded remains of a range of cereals and pulses (Walker and Bogaard 2011). Crop diversity at these north Balkan sites, however, is less than in the southern Balkans and Greece, as typically 'Mediterranean' pulses (grass pea, chickpea) are absent in the earlier Neolithic. The formation of 'tells' in the north Balkan LN/Chalcolithic coincides with a major increase in available data, including burnt house assemblages of diverse crop 'stores' (Gyulai 2007), confirming that the low density of plant remains on 'flat' sites is a function of preservation.

Pollen analyses (Willis and Bennett 1994) and on-site charcoal (Ntinou and Badal 2000; Marinova and Thiébault 2008) suggest very limited clearance of woodland. Arable weed assemblages from the southern Balkans, especially rich in Bulgaria (Marinova 2006), suggest permanent cultivation plots: few woodland taxa but many of disturbed habitats imply plots established for 5–10 years at least (cf. Bogaard 2002). Ecological analysis further suggests autumn sowing, excluding spring sowing of floodplains. Bulgarian assemblages contain the mixture of 'root-/row-crop weeds' and 'cereal weeds' characteristic of small-scale and intensive cultivation (Jones et al. 1999). Sheep/goat dung implies herding near settlements, compatible with small-scale animal husbandry. In the northern Balkans, potential arable weeds at EN Ecsefalva 23 and Măgura-Buduiasca also suggest long-established, intensively managed plots, which at the former site could be accommodated within areas of dry ground above seasonal floods (Bogaard et al. 2007).

Animal exploitation in south-east Europe

Despite variation in preservation and recovery, faunal assemblages exhibit some recurrent trends, especially when small samples (less than 400 identified specimens) are excluded. Domesticates usually make up more than 95% of the mammals on Neolithic open sites in Greece (Cantuel et al. 2008) and similarly dominate EN assemblages

from Anza in FYROM (Bökönyi 1976), through Starčevo (following Legge 1990) and Divostin (Craig et al. 2005) in Serbia, to Ecsegfalva 23 in the Hungarian plain (Bartosiewicz 2007a). In central Greece, evidence for hunting, especially of large game (red deer, boar), increases modestly in the LN (fifth to fourth millennium BC) (von den Driesch 1987) and sharply (to 10–50%) on some Bronze Age open sites. A more rapid increase occurs in the LN (fifth to fourth millennium BC) north Balkans: at Vinča (Dimitrijevič 2008), Selevac (Legge 1990), and Polgár-Csöszhalom (Bartosiewicz 2005). Both large (especially red deer and boar) and small mammals are represented in late Mesolithic levels at Franchthi cave in southern Greece and sites such as Lepenski Vir in the Iron Gates gorge between Serbia and Romania. The contrasting scarcity of EN evidence for hunting recurs from the relatively arid and lightly wooded south of Greece, through the better-watered and more densely wooded valleys of Serbia, to the seasonally inundated Hungarian plain, and so, excluding the Greek islands, is unlikely to reflect availability of game. Interpreting this apparent avoidance of hunting (Bartosiewicz 2005, 60; 2007a, 298–299) in terms of the ‘domestic’ symbolic concerns of colonist farmers (Hodder 1990) is favoured by EN avoidance of antler for tools or ornaments and the contrasting LN mortuary deposition of ornaments made from boar and red deer teeth in Hungary (Bartosiewicz 2005, 58). Small game, however, is not avoided (von den Driesch 1987): EN sites in Greece (Cantuel et al. 2008) and Anza in FYROM (Bökönyi 1976) have yielded mammals such as hare, fox, cat, marten, and roe deer and wetland sites on the Hungarian plain also an impressive diversity of birds and fish (e.g. Gál 2007; Bartosiewicz 2007b). Similarly, comparison of worked and unworked bone at LN (sixth to fifth millennium BC) Makriyalos in northern Greece reveals that domesticates and *small* game were selected, and *large* game avoided, as raw material for artefacts (Isaakidou 2003). Large game, therefore, normally subject to greater obligations of sharing than small game or domesticates (cf. Barnard and Woodburn 1991), might have been hunted by early farmers, but consumed (collectively?) away from excavated open settlements.

Sheep are the predominant domesticate, especially in the earlier Neolithic, at open sites in Greece and FYROM and on the Hungarian plain (Bökönyi 1976; Bartosiewicz 2007a; Cantuel et al. 2008; Halstead 1996), although cattle are equally frequent at Divostin in Serbia (Craig et al. 2005). In the LN, sheep give way to cattle or pigs, most rapidly and sharply in the north Balkans (Bartosiewicz 2005; Dimitrijevič 2008; Greenfield 1999; Legge 1990). Cantuel et al. (2008, 287) attribute the EN dominance of sheep (grassland animals) in a more or less wooded landscape to early farmers’ lack of expertise, and

Whittle and Bartosiewicz (2007, 741) to the cultural conservatism of colonists. Bökönyi (1973, 168) argued that livestock reproduced too slowly for early farmers to adjust herd composition to local environments, but goats and especially pigs are more prolific than sheep and could rapidly have outnumbered them if farmers wished. The dominance of sheep would be unsurprising, however, if livestock were few and often confined to cleared plots (stubble, fallow, field margins, sprouting cereals) rather than being numerous and ranging widely across the landscape (Halstead 2006). Several lines of evidence are consistent with initially small-scale animal husbandry. First, pollen and charcoal fail to register the impact of early farmers on vegetation. Second, biometric distinction between large wild and smaller domestic cattle and pigs becomes increasingly clear through the Neolithic (von den Driesch 1987; Legge 1990), implying limited interbreeding (as do DNA and aDNA) between domestic and wild populations. The difficulty of isolating modern free-range pigs from wild boar suggests early domesticates were few enough to be herded closely or corralled. Third, dental microwear in sheep and goats from EN Ecsefalva 23 in Hungary (Mainland 2007) and LN Makriyalos in northern Greece (Mainland and Halstead 2005) reveals a very abrasive diet, implying restriction to heavily overgrazed or freshly cultivated pasture. Early livestock in south-east Europe, therefore, were probably few in number and often enclosed on cleared land—an anthropogenic niche ideal for sheep. Conversely, increasing proportions of cattle and/or pigs in the LN may reflect larger numbers of livestock exploiting the landscape more extensively and, in Greece, possibly leaving their imprint in the palynological and geoarchaeological records (Willis 1994; van Andel et al. 1990).

Sheep exhibit a ‘meat’ culling strategy (slaughter of juvenile–sub-adult males, retention of adult females) from Greece (Halstead 1987, 1996; Helmer 2000; Isaakidou 2006) to the north Balkans (Bökönyi 1971, 650; Greenfield 2005; Legge 1990; Bartosiewicz 2007a, 300; Dimitrijević 2008). Data are sparser for goats and cattle, but ‘meat’ mortality is evident for both at EN–FN Knossos on Crete (Isaakidou 2006) and for cattle at EN Blagotin (Greenfield 2005) and LN Selevac (Legge 1990) and Vinča in Serbia (Dimitrijević 2008); exceptions (e.g. EN Ecsefalva 23—Bartosiewicz 2007a) may be due to small sample size. A ‘meat’ strategy does not preclude modest exploitation for secondary products, however, and organic residues in ceramics indicate milking at least in the sixth millennium BC at LN Stavroupoli in northern Greece (Evershed et al. 2008) and EN Ecsefalva 23 and Schela Cladovei in the north Balkans (Craig et al. 2005). Likewise, at Neolithic Knossos, numerous ‘pathological’ traces in adult cows suggest use for traction, albeit on a smaller scale than is possible with

oxen (Isaakidou 2006, 2008). Similar traces are reported in smaller numbers elsewhere in Neolithic south-east Europe (e.g. Poduri, Romania—Balasescu et al. 2006).

‘Meat’ mortality precludes specialized dairying, however, and this, coupled with initially small-scale animal husbandry, means that the dietary staples were grain crops, although animal produce doubtless improved the nutritional balance, security, and variety of the food supply and was perhaps doubly important because of the social contexts in which it was consumed (see ‘Synthesis: subsistence and society in Neolithic southern Europe’). Livestock were also probably integral to early crop husbandry: manure of animals confined on arable land would have contributed to soil fertility, sheep perhaps controlled the resulting risk of ‘lodging’ (stem collapse) by light grazing of sprouting cereals, whilst cows pulling an ard (scratch-plough) or a sledge loaded with stall-manure could have enabled intensive cultivation on a larger scale. Ploughing also aids timely sowing and so reduces the risk of crop failure, particularly in southern Greece where severe summer drought places sowing under acute time stress (Isaakidou 2008). This underlines the importance of early draught cattle at Knossos.

The open settlements in fertile lowlands that dominate the Neolithic record of south-east Europe were probably occupied year-round (e.g. Bartosiewicz 2007a, 2007b; Gál 2007; Halstead 2005), but early farmers must also have ranged regularly beyond their homes and gardens for medicinal plants, raw materials, pasture or game, and social contacts. Such forays are perhaps reflected in the abundance of game (much higher than on the nearby Hungarian plain) at EN open sites in the Iron Gates gorge (Bartosiewicz 2007a). Stable isotopic analysis of human remains here and at Theopetra cave in central Greece suggests a ‘Neolithic’ diet (Bonsall et al. 2004; Papathanasiou 2003), perhaps reflecting links to nearby settlements with greater arable potential. There is no evidence that EN farmers regularly moved long distances or established distant ‘satellite’ sites in the context of seasonal herding or hunting.

In southern Greece, sparse EN settlement in fertile valleys expanded in the LN to areas less favourable to grain crops because of low rainfall or poor soils. Alongside established ‘villages’, small, short-lived sites proliferated and the use of caves increased dramatically. The agriculturally marginal location of many new sites has been interpreted in terms of seasonally mobile pastoralism (e.g. Sampson 1992) and traces of dung indicate penning of animals in Kitsos (Brochier et al. 1992, 48) and Kouveleiki A (Karkanas 2006) caves. At the small open site of Kefala and caves of Kalythies, Kastria, Skoteini, and Zas, goats are more frequent and cattle and pigs less so than at

contemporary villages ([Halstead 1996](#), 31, fig. 2), consistent with herding on a scale large enough to require adjustment to local landscape. ‘Meat’ mortality for sheep and goats again precludes specialized dairying ([Halstead 1996](#)), however, whilst isotopic and pathological evidence from human skeletons implies a crop-based diet at both inland (Kouveleiki, Skoteini) and coastal (Alepotrypa) caves and the Kefala hamlet ([Papathanasiou 2003](#)). Some caves have yielded remains of cereals and pulses, although it is not clear whether crops were grown locally, whilst others were used for burial; increasing evidence for use of caves perhaps reflects changes in social practices as much as subsistence routines. LN–FN marginal colonization by small open sites and perhaps caves thus seemingly replicated the mixed farming of earlier Neolithic villages. Any expansion in the scale of herding apparently did not weaken dietary dependence on grain crops, although more frequent crop failures in marginal areas probably made livestock more important as an emergency food source.

SOUTH-WEST EUROPE

Plant use and husbandry in south-west Europe

Archaeobotanical evidence from Dalmatia has been limited by a research focus on caves in karstic terrain unsuitable for agriculture ([Moore et al. 2007a](#)). Crops are therefore lacking even for periods when cultivation is beyond doubt ([Forenbaher and Miracle 2005](#)). However, recent large-scale sampling has recovered EN cereals (barley, emmer, einkorn), pulses (lentils, grass pea), flax, and wild fruits from the open settlement of Prokovnik ([Moore et al. 2007b](#)) and a similar spectrum from the MN settlement of Danilo ([Moore et al. 2007a](#)).

Data from Italy derive mostly from open-air sites, but two caves are noteworthy. At Uzzo in Sicily ([Costantini 1989](#)), Mesolithic levels yielded sparse wild legumes, fruits and nuts (strawberry tree, acorn, grape), whilst the earliest Neolithic yielded a range of cereals (einkorn, emmer, barley) and pulses (lentil, grass pea, or vetchling), as well as olive and figs. In north-west Italy, EN remains from Arene Candide include a range of cereal types ([Binder and Maggi 2001](#)). The rarity of cereal chaff and weed seeds from central-western Mediterranean cave sites arguably reflects processing at habitation sites elsewhere ([Zapata et al. 2004](#); [Peña-Chocarro 2007](#)).

Sparse data from open-air sites in central and southern Italy suggest

cultivation of multiple cereals (barley, einkorn, emmer, free-threshing wheat) and pulses (pea, lentil, vetches, broad bean) (Rottoli and Pessina 2007). Waterlogged preservation at sixth millennium BC La Marmotta confirms a similarly broad spectrum, alongside oil-seed crops (flax, opium poppy) and a range of wild plants. Grape remains may suggest viticulture. Together with evidence from Iberia (see below, this section), abundant poppy remains from La Marmotta indicate cultivation of this species within its natural central-west Mediterranean distribution area by the mid-sixth millennium BC. Opium poppy currently provides the clearest botanical case of local domestication in Neolithic Europe.

A similar diversity of cereals (barleys, emmer, einkorn, free-threshing wheat), pulses (pea, lentil, bitter vetch, grass pea), and fruits/nuts (hazelnut, apple, acorn, blackberry, hawthorn, plum, grape) characterizes sites in northern Italy, such as mid-sixth to mid-fifth millennium BC Sammardenchia (Rottoli and Pessina 2007). A burned house at Lugo di Romagna provides a snapshot of household-level plant use, including emmer (in store), barley, free-threshing wheat and a little einkorn, peas, lentils, acorns, and hazelnuts (Rottoli and Pessina 2007). The role of wild plant foods is underlined by frequent concentrations of acorn shell (Rottoli and Castiglioni 2008).

In southern France, the scarcity of archaeobotanical data from EN (Cardial) caves and rock shelters has been linked with slow uptake of farming relative to pottery and domestic animals but probably reflects site type and location (Mills 1984). Though sparse, data suggest use of a range of cereals, including einkorn, emmer, free-threshing wheat, and naked barley (Hopf 1991). Limited archaeobotanical investigation of MN (Chasséen) open-air sites suggests use of bitter vetch and broad bean alongside cereals (Hopf 1991; Marinval 1991). Intensive sampling and flotation at a high-altitude MN (mid-fifth to mid-fourth millennium BC) open-air site, Le Chenet des Pierres in the French Alps, has revealed abundant evidence for cereals (especially naked wheat and barley), pea, opium poppy, arable weeds, and collected fruits and nuts (Martin et al. 2008). Together with regional ethnohistorical and palynological evidence, the assemblage suggests high-altitude farming as a possible alternative to widely assumed seasonal transhumance between plains and mountains (see ‘Animal exploitation in south-west Europe’).

Open-air sites in Iberia have yielded crop processing residues (chaff as well as grain) lacking at cave sites (Zapata et al. 2004; Stika 2005). The partially submerged later sixth millennium BC open site of La Draga in Catalonia exemplifies the contrasting preservational biases of charring (evidence for cereals and pulses) versus waterlogging (evidence for gathered wild plants) (Buxó et al. 2000; Buxó, pers.

comm.). Iberian cave sites co-existed with open settlements and probably served specialized purposes such as animal shelters. Archaeobotanical datasets from EN caves in Catalonia range from a lack of crop remains at Bauma Serrat del Pont to multiple cereal and pulse crops at Cova 120 (Buxó 2007; Zapata et al. 2004). Further down the Mediterranean coast, caves provide most of the available evidence, encompassing cereals, pulses, and wild plants, especially acorns (Buxó 2007; Zapata et al. 2004). In Andalusia, Cueva del Toro yielded a wide spectrum of cereals (emmer, free-threshing wheat, naked barley) and pulses (pea, lentil, broad bean, bitter vetch, grass pea), and Cueva de los Murciélagos mid-sixth millennium BC opium poppy alongside free-threshing wheat, emmer, and naked barley (Peña-Chocarro 2007). In north-central Iberia, La Vaquera cave yielded a range of cereals and two pulses (lentil, vetch) as well as acorns and grapes; a lack of chaff contrasts with finds of chaff and grain at open-air La Lámpara and La Revilla del Campo in the northern Meseta (Peña-Chocarro 2007; Stika 2005). In mostly fifth millennium BC assemblages from caves in north-west Spain, Pico Ramos seems specialized in wild resources, whilst others (e.g. El Mirón) yielded sparse remains of cereals alongside domestic fauna (Zapata et al. 2004; Zapata 2007).

Wood charcoal from caves and rock shelters in north-west Italy and southern France (Thiébault 2001, 2005; Vernet 2005) generally suggests weak EN human impact on woodland in karstic hill and mid-altitude mountain zones. Increased evergreen oak and *garigue* scrub plants from the MN onwards may reflect use of deciduous oak, ash, and other species for leaf fodder. The scale of EN–MN upland herding probably varied across the western Mediterranean but was apparently modest compared with recent practice (see ‘Animal exploitation in south-west Europe’) (Thiébault 2001; Delhon et al. 2009).

Caves used as animal pens (*grottes bergériés*) have been identified from dung deposits and shed deciduous teeth (see ‘Animal exploitation in south-west Europe’). Archaeobotanical analysis of burnt dung layers at early fifth to mid-third millennium BC La Grande Rivoire suggests leaf and twig foddering using oak, ash, lime, and hazel, echoing evidence from Alpine Foreland lake villages (Delhon et al. 2008) and supporting previous charcoal- and pollen-based inferences at cave sites across the French Alps (e.g. Thiébault 2005). Given the opportunistic nature of gathering twig fodder during winter/early spring, and the high labour costs of gathering and storing leafy fodder, evidence of both practices at upland and lowland/lakeshore sites suggests herding on a small scale. The same may be argued for south-east Spanish caves (Badal 2002, 143).

South-west European weed assemblages are generally too sparse for

in-depth ecological analysis, but the taxa attested suggest established plots rather than shifting cultivation (e.g. [Rottoli and Pessina 2007](#); [Stika 2005](#); cf. [Bogaard 2002](#)). Relatively abundant evidence from LN Clairvaux Station III, Chalais in the French Jura suggests cereal husbandry akin to intensive ‘gardening’ ([Lundström-Baudais 1986](#)).

Animal exploitation in south-west Europe

Although faunal analysis has focused on caves and rock shelters, fairly consistent evidence is emerging from lowland open settlements. In Dalmatia, lowland EN–MN (sixth millennium BC) villages at Pokrovnik, Danilo, Nin, and Tinj-Podlivade resemble those in Greece and the eastern Balkans: very sparse evidence for hunting (mainly small game at Pokrovnik and Danilo) and heavy dominance of sheep, which exhibit ‘meat’ mortality ([Legge and Moore 2011](#); [Miracle 2006](#); [Mlekuz 2005](#)). In southern Italy, early Neolithic (sixth to fifth millennium BC) ditched enclosures as at Passo di Corvo, Rendina, and Santa Tecchia (see [Skeates](#), this volume [ch. 41](#)) likewise have little evidence for hunting and sheep/goats account for 50–65% of domesticates, with sheep/goats and cattle at Torre Sabea again matching ‘meat’ mortality ([Vigne 2003](#)). The nature of animal exploitation at many smaller open settlements is largely unknown. In lowland central Italy, domesticates predominate in small samples from EN (sixth millennium BC) open settlements at Villaggio Leopardi and La Marmotta ([Cassoli and Tagliacozzo 1995](#)). On the coast of southern France, the EN open settlement at Portiragnes displays little hunting and specialization in sheep that exhibit ‘meat’ mortality ([Tresset and Vigne 2007](#); [Vigne and Helmer 2007](#), 25, fig. 6). In Spain, there is growing evidence for EN *open* settlements, which include substantial ditched enclosures as at Mas d’Is ([Bernabeu et al. 2003](#)), but faunal evidence is still sparse. Domesticates make up 93% of the sample from EN La Draga, with sheep/goats most abundant and mortality among sheep/goats and cattle conforming to a ‘meat’ strategy ([Saña 2000](#)).

With EN open settlements displaying scarcity of game, predominance of sheep (/goats) over cattle and pigs, and ‘meat’ mortality, faunal as well as archaeobotanical evidence broadly resembles that from south-east Europe and a similar regime of small-scale, integrated mixed farming has been suggested ([Bernabeu et al. 1995](#), 269–281; [Robb and Van Hove 2003](#)). Early predominance of sheep is often less marked than in south-east Europe (though most Italian assemblages are small or cover broad temporal spans), but coastal sites in southern France and eastern Spain, specializing in sheep, have been interpreted as ‘beachheads’ of colonist farmers ([Vigne 2000](#)).

Later Neolithic open sites to varying degrees display the more even balance of domesticates seen in south-east Europe. In Dalmatia, sheep(/goats) were heavily dominant in the EN, but drop to c. 60% of domesticates at FN Bukovic (Miracle 2006). In Italy, at MN–LN Masseria di Gioia and FN Neto-Via Verga, small samples are again inconsistent. Southern Iberia is more informative, though LN–Copper Age (fourth to third millennium BC) open sites must be compared with EN caves such as Cendres, Nerja, Or, and Sarsa (Pérez Ripoll 1999). At the latter, sheep are the commonest domesticate, followed by pigs, with goats and cattle scarce, whilst on later open sites these four species are fairly evenly represented. Although the EN caves were apparently not specialized herding sites (see below, this section), the trend from sheep at EN caves to goats at later open sites, which does not match *local* grazing conditions, suggests an *overall regional* expansion of animal husbandry (Pérez Ripoll 1999, 98), as has tentatively been proposed for LN south-east Europe. Charcoal data, however, suggest that the combined impact of crop and livestock husbandry on local vegetation was modest until the third millennium BC (Badal et al. 1994). Mortality data for the LN–Copper Age show high proportions of juvenile and sub-adult deaths for combined sheep and goats, consistent with management primarily for meat. An exception is third millennium BC Arenal de la Costa, where goats outnumber sheep and many animals reached old age. Together with much higher adult male survivorship for sheep than goats at third millennium BC Cerro de la Virgen, Valencina de la Concepción, and Zambujal, this implies management for different goals: sheep for meat (and conceivably wool); goats for milk (Pérez Ripoll 1999). The survival of most cattle to adulthood (with 20–40% achieving old age at fourth millennium BC Jovades and third millennium BC Ereta del Pedregal, Arenal de la Costa, and Cerro de la Virgen) and high proportions of adult males (including probable castrates) favour traction, as do ‘traction pathologies’ (Pérez Ripoll 1999). Unfortunately, faunal evidence is insufficient to explore the relationship between animal husbandry strategies and different types and sizes of sites.

At Molino Casarotto (c. 5000 BC) in the Alpine foothills of north-east Italy, lake-side huts with ceramics are associated with sparse remains of domestic animals and crops, but abundant red deer, boar, and gathered water chestnuts (Jarman 1971), whilst EN (sixth millennium BC) open sites further east, at Piancada and Nogaredo al Torre, are overwhelmingly dominated by domesticates. Only regional-scale analysis of seasonality and *human* mobility will clarify whether Molino Casarotto represents limited adoption of domesticates by foragers or seasonal foraging by farmers. In north-east Spain, EN open

sites with domesticates and caves with mainly wild fauna (e.g. [Chaves, Fosca](#)) raise similar questions. Likewise, on the Atlantic coast of north-west Spain, domesticates are increasingly documented from the fifth millennium BC, but wild plants and animals predominate at some sites ([González Urquijo et al. 1999](#)). In the extremely heterogeneous western Alps, however, where domesticates predominate at EN open sites in valleys (e.g. [Sion Planta](#)), it seems implausible that caves with mainly wild animals (e.g. [La Balme de Thuy](#)) represent independent groups of foragers ([Chaix and Sidi Maamar 1993](#)).

Open-air sites devoted largely to hunting are also known from the LN, as at fourth millennium BC [Roucador](#) or [Mulino Sant' Antonio](#) ([Albore Livadie et al. 1987–88](#)) in the hills of southern France and southern Italy respectively. In southern Italy, ceremonial deposition of deer crania in the [Ipogeo Manfredi](#) and of wild animal bones in [Grotta Scaloria](#), and use of deer canines as personal ornaments, all underline the symbolic importance of game ([Robb 2007](#), 128). In north-east Spain bones of wild animals are selected in fourth millennium BC graves at [Camí de Can Grau](#) ([Gibaja 2004](#)). Painted human and animal representations in southern Italian caves, such as [Grotta del Genovese](#), suggest a link between hunting and rites of social reproduction ([Pluciennik 2002](#); [Skeates 1994](#)). The same may be argued for the potentially LN rock art in eastern Spain ([McClure et al. 2008](#)). The performance of these rites at a distance from agricultural settlements presumably played a part in regional-scale social integration and landscape enculturation (e.g. [Bernabeu et al. 2003](#)).

The use of caves to shelter livestock is widely attested in southern France, eastern Spain, northern and southern Italy, and along the eastern side of the Adriatic (e.g. [Boschian and Montagnari-Kokelj 2000](#); [Brochier et al. 1992](#)). A distinction must be drawn, however, between the presence of dung with rich cultural material (e.g. [Font Juvé](#) rock shelter, south-west France—[Brochier 1991](#), 306), implying management of livestock among other activities, and thick layers of dung with little cultural material, reflecting specialized use for penning livestock. In southern France, specialized *grottes bergères* seem particularly characteristic of the MN (fifth to fourth millennium BC) [Chasséen](#) period, with more mixed use attested before and afterwards ([Brochier 1991, 2006](#)). Corralling of livestock in caves likewise began, or intensified, a few centuries into the local Neolithic at [Edera](#), [Zingari](#), and perhaps [Pupicina](#) in the Istrian karst ([Boschian and Montagnari-Kokelj 2000](#); [Forenbaher and Miracle 2005](#)), at [Arene Candide](#) on the coast of north-west Italy ([Courty et al. 1991](#)), and at [Cendres](#) in eastern Spain (although loss of cultivable land to rising sea level may have been a factor in the last case). From a few centuries after the inception of farming, therefore, in several regions of south-

west Europe, livestock were sheltered in caves in greater numbers or for longer periods and, at Cendres, charcoal registers their impact on local vegetation (Badal 2002). MN livestock numbers remained well below the level needed to create the ‘degraded’ landscapes of the recent past, however, and at Bélesta cave in the Pyrenean foothills did not significantly transform vegetation until the Bronze Age (Brochier et al. 1998).

The scarcity of cultural material in *grottes bergeries* implies primary human habitation elsewhere. Moreover, whilst shed milk teeth (fallen from *live* animals) are present in some of these caves (e.g. Baume Ronze), their absence in others implies removal of at least part of the herd (Brochier 2006; Helmer et al. 2005) for at least part of the year. ‘Home’ settlements were perhaps not adjacent to the caves given that accumulations of dung were left *in situ* rather than removed to fertilize arable plots (Brochier 2006, 141), but hints of year-round slaughter at caves across the region (Forenbaher and Miracle 2005; Helmer et al. 2005, 180; Rowley-Conwy 1991) imply a distance that could be covered in hours rather than days. Caves with Neolithic evidence for penning of livestock are mostly at low to medium altitudes (0–600m) and several have faunal evidence (newborn lambs or kids, shed deciduous teeth of young adult sheep or goats) of late winter–early spring use (Forenbaher and Miracle 2005; Helmer et al. 2005; Rowley-Conwy 2000). Possibly livestock were removed in late winter from open settlements, where very young lambs and kids are scarce (Helmer et al. 2005), to safeguard growing crops or to shelter in caves from cold weather (especially important for pregnant/lactating females and newborn offspring). Neolithic flint scatters have been found above 1900 m in the southern French Alps (Walsh et al. 2006), close to potential summer pasture, but faunal remains from mid-altitude caves provide as much evidence of hunting as herding (e.g. Chaix and Sidi Maamar 2003). There is no hint that MN *grottes bergeries* were integrated in long-distance transhumant pastoralism (Brochier 2006) and some subsequently saw more intensive habitation and a more diverse domestic animal fauna, suggesting use as (or proximity to) mixed farming residential bases (Brochier 2006, 147–148). The same trend is apparent east of the Adriatic, at Pupicina (Forenbaher and Miracle 2005) and perhaps Grapčeva (Miracle 2006), and in southern Greece, at Zas. *Grottes bergeries* may thus represent a short-term phase in the expansion of mixed farming, rather than the development of specialized pastoralism.

Milk residues have been found in EN pottery from Mala Triglavca rock shelter in Slovenia (Soberl et al. 2008), and early lamb or kid mortality consistent with intensive ‘milk’ management at several caves across the region from Ciclami, Edera, Mitreo, Pupicina, and Zingari at

the head of the Adriatic (Miracle 2006; Mlekuz 2005) to EN Arene Candide (Rowley-Conwy 2000) and MN Combe Obscure (Vigne and Helmer 2007) further west. ‘Milk’ mortality could be an artefact of seasonal use of caves, around lambing/kidding time, but is encountered in caves with evidence of slaughter in other seasons too (Mlekuz 2005). Moreover, contrasting levels of infant mortality for sheep and goats at EN–MN Arene Candide (Rowley-Conwy 2000) and EN Baume d’Oulen (Helmer et al. 2005) suggest a real difference in management goals (as also in LN–Copper Age southern Iberia—see above, this section). Relatively enriched stable nitrogen isotope ratios from Neolithic humans at EN–MN (sixth to fourth millennium BC) Arene Candide and, to a lesser extent, EN (sixth millennium BC) Pendimoun are consistent with diets high in animal protein (Le Bras-Goude et al. 2006).

Dairying yields more energy per animal than consumption of meat alone, but is more labour-intensive and riskier. Neolithic sheep and goats exhibit ‘meat’ mortality at Cavallo, Madonna, and Uzzo caves in southern Italy (Tagliacozzo 1993, 2000) and at most such sites in southern France (Vigne and Helmer 2007). ‘Milk’ mortality profiles are restricted to the earlier Neolithic in several caves at the head of the Adriatic (Miracle 2006; Mlekuz 2005), at Arene Candide in north-west Italy (Rowley-Conwy 2000), and (for cattle as well as sheep/goats) in open settlements of the lower Alpine valleys. Dairying was perhaps characteristic of the inception of farming, when limited clearance restricted numbers of livestock, and gave way to less labour-intensive ‘meat’ management when expanding clearance allowed larger herds (Legge 1981; also Rowley-Conwy 2000).

SYNTHESIS: SUBSISTENCE AND SOCIETY IN NEOLITHIC SOUTHERN EUROPE

Stable isotope evidence of the Neolithic human diet in southern Europe points to subsistence on terrestrial plants and animals, the remains of which are overwhelmingly from domestic cereal and pulse crops and livestock. Livestock were exploited for milk as well as meat and, alongside wild resources, contributed to a more diverse and balanced diet. Prevalent ‘meat’ mortality precludes widespread specialized dairying, however, and implies primary dependence on crops—especially for ‘village’ communities. At a few caves on the northern margins of the west Mediterranean, however, sheep and/or goat approximate to a ‘milk’ pattern, especially in the EN. Apparently not just an artefact of seasonal mobility, this might reflect greater dietary reliance on livestock where cultivation was unreliable, as

human stable isotope data from Arene Candide perhaps imply.

Evidence of indoor storage, principally from burnt levels on south-eastern tells and rare south-western waterlogged sites, suggests diversified crop production by small residential groups or 'households', whilst dehusking by-products of hulled wheats on open-air sites are consistent with piecemeal, household-level food preparation. Some Mediterranean pulses did not initially spread to the north Balkans, but farmers grew a wide range of grain crops, thus spreading labour and risk and introducing dietary diversity. Labour-intensive pulses hint at small-scale cultivation, consistent with low anthropogenic impact on local and regional vegetation in charcoal and pollen records, respectively; crop weeds also suggest stable and probably intensive cultivation. Temporal and regional variability in archaeobotanical data arguably reflect differential preservation and retrieval, rather than differences in crop husbandry.

Cattle mortality usually approximates to a 'meat' strategy, but together with 'traction pathologies' suggests draught oxen in south-east Spain in the LN-Copper Age, compatible with [Sherratt's \(1981\)](#) fourth to third millennium BC 'secondary products revolution'. Data from Crete, however, indicate much earlier use of draught cows, consistent with small-scale tillage and thus intensive crop husbandry, and suggesting particular reliance on draught cattle where autumn sowing was under greatest time stress. In south-east Europe, early dominance of sheep suggests small-scale herding tied to arable land; later increases in pigs, cattle, or goats may reflect larger numbers making wider use of the landscape, although dental microwear in both periods implies close confinement on disturbed or overgrazed land. In the south-west, species composition displays a similar trend; differences in some regions may partly be due to sampling. Wild animals are scarce on most open settlements, but better represented at some caves and rock shelters especially in the west Mediterranean, where hunting is also celebrated in rock art. Use of wild animal teeth as ornaments in south-west and south-east Europe, however, and the introduction of wild animals to Aegean islands, suggests more widespread cultural significance. Use of caves for burial and herding is better documented in south-west than south-east Europe, probably reflecting regional differences in social reproduction rather than land use; in both regions caves sheltered small-scale, short-distance herding with limited impact on the regional landscape.

With domestic storage and intensive crop husbandry in stable clearings, households probably enjoyed recurring rights to cultivated plots, even if a larger 'village' community undertook clearance, enclosure, and defence. Household control of plots and produce would have reduced risk of underproduction in the face of highly seasonal

demands for hard labour, but threatened collective cohesion. Neolithic societies in southern Europe asserted domestic independence through architectural elaboration of houses and communal solidarity through enclosure, burial, and other rites emphasizing collective identity. Rituals in caves confirm that collective identity was bound up with control of the wider cultural landscape, beyond enclosed gardens.

Elaborate ceramic ‘tableware’ stresses the importance of formal commensality. In contrast to domestic storage of staple crops, most livestock were killed too old, and so too big, for consumption by a single household, but carcasses were processed intensively (Halstead 2007; Saña 2000, 160). *Pre*-depositional dispersal of carcass parts at EN–FN Knossos and EN Paliambela-Kolindrou suggests widespread distribution of meat (Isaakidou 2007). Since most domesticates *could* have been slaughtered younger and smaller, they were arguably raised *for* consumption by large social groups. The animals slaughtered ranged from small lambs to large adult cattle, however, so the consumption of meat, and of beverages such as wine or milk (Urem-Kotsou et al. 2002; Valamoti et al. 2007), was probably a vehicle for competition as well as solidarity. At LN Makriyalos, northern Greece, a pit with remains of hundreds of butchered animals, standardized serving vessels, and individualized cups simultaneously signals collective solidarity and intra-communal competition (Pappa et al. 2004). Commensality presupposes surplus, probably intrinsic to grain production in the highly seasonal and somewhat uncertain climate of southern Europe (Halstead 1989). Given unpredictable harvests and labour supply varying over the domestic cycle, early farming households will periodically have under- or overproduced relative to their needs. Surplus grain of limited ‘shelf-life’ could have been used to recruit labour or to fatten livestock for consumption at a feast that would earn political capital and so help recruit labour in future. Although of secondary dietary importance, therefore, livestock were central to Neolithic political economies and their articulation with staple crop production.

CONCLUSION: FROM PATTERN TO PROCESS

The traditional model of sudden change from mobile Mesolithic foragers to sedentary Neolithic farmers has rightly been questioned. To a surprising degree, however, south-west Asian crop and livestock species were adopted rapidly and as an integrated package across southern Europe. The transition was doubtless gradual and piecemeal on the timescale of human agents, but available temporal resolution obscures this, and much purported evidence for gradual transition

may be illusory. Hunting played an important role in Neolithic social reproduction and landscape enculturation, but not normally in subsistence. Neolithic settlement patterns varied regionally and diachronically, as did subsistence practices, but regional variability in archaeobotanical and faunal data is mainly shaped by archaeological formation processes and research traditions. Available evidence suggests Neolithic populations across southern Europe subsisted primarily on cereal and pulse crops, probably grown under small-scale, intensive, and stable conditions. Livestock were of secondary dietary significance, though integral to crop production and social interaction. Adoption of south-west Asian domesticates was linked with unprecedented forms of social integration (household, local community), property (domestic control of stored crops and probably arable plots), and cultural landscape (often focused on relatively long-lived settlements), making discussions surrounding the relative role of economy and ideology in Neolithization meaningless; much of the elaborate material culture of Neolithic southern Europe may represent strategies for mediating tensions inherent to the new and dynamic social order, domestic economy, and ideology. Despite adopting a largely common set of domesticates, Neolithic societies across southern Europe exhibit considerable regional, and sometimes local, diversity in strategies of residence, social reproduction, and landscape enculturation. Whether colonists or acculturated foragers were the biological ancestors of Europe's earliest farmers is currently unanswerable, but in any case sheds little light on EN social formations, let alone those that developed over the following three or four millennia. The agency of early European farmers is evident in their diverse mediations of the tensions and contradictions inherent to Neolithic economy and ideology, not in obedience to environmental constraints or cultural templates.

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CHAPTER 21

SUBSISTENCE PRACTICES IN CENTRAL AND EASTERN EUROPE*

LÁSZLÓ BARTOSIEWICZ AND MALCOLM LILLIE

Subsistence is production without major surplus, when ‘people ... grow what they eat’

(Waters 2007, 2).

BIOARCHAEOLOGICAL evidence results from multiple feedback mechanisms between differential preservation, selective recovery, and ideologically determined interpretation (Fig. 21.1). Consequently, the different techniques employed by bioarchaeologists throughout the Near East and Europe make it difficult to develop a nuanced understanding of the transition to agriculture (e.g. Conolly et al. 2008). Beyond these technical differences, the Neolithic in central and eastern Europe shows considerable diversity in subsistence strategies. Historically, the spread of agriculture across Europe was viewed as a process of population diffusion from the Balkans (see Bogaard and Halstead, this volume), where agriculture had flourished under Near Eastern influences. However, subsequent research has revealed complex alternatives (e.g. Barker 1985; Colledge et al. 2004, 2005; Richards et al. 2000; Whittle 1996; Zvelebil 1986). Hunting, fishing, and gathering clearly varied in importance, depending on location and socio-economic conditions. As Bogucki (2004, 202) notes, the spread of agriculture across Europe combined colonization and local adoption.

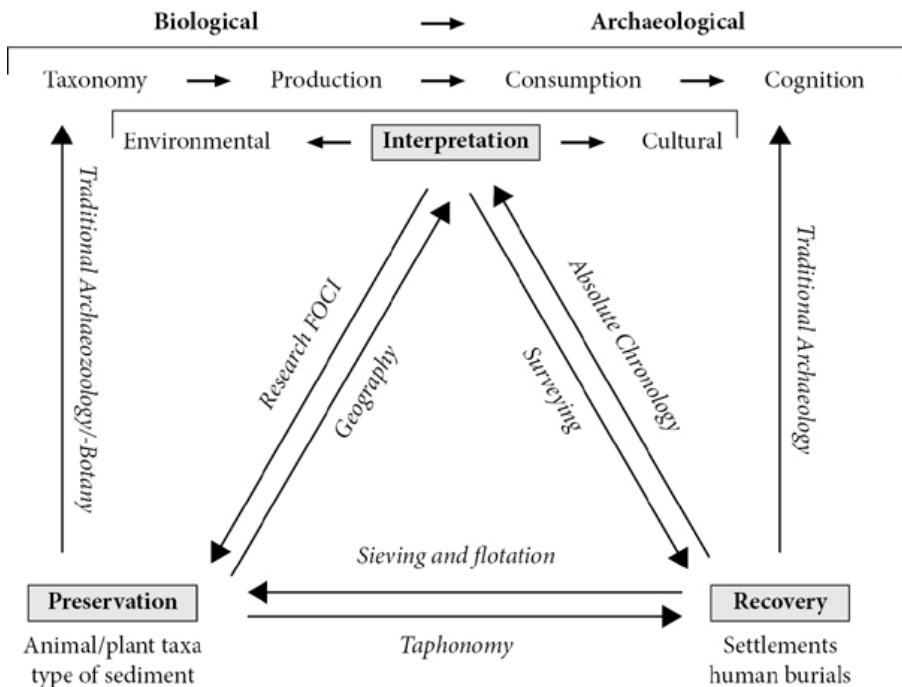


FIG. 21.1. Selective processes and feedback systems determining the interpretation of bioarchaeological evidence. Note the interrelatedness of preservation, recovery, and interpretation and the way they link traditionally disparate biological and archaeological reasoning.

Mixed agriculture reached central Europe from the south-east and south. The available domesticated crops, and most animals, originated in the Near East. The earliest domesticated animals—caprines (sheep/goat), cattle, and pig—in Europe occur in Greece by c. 7000 BC (e.g. [Price 2000](#)). Across Europe, many factors influenced the rate of spread, integration, and ultimate adoption of these new/alternative subsistence strategies as ‘farming’ was disseminated ([Thomas 2004](#)). Hence, the timing of the onset of the Neolithic varies throughout Europe. This chapter contrasts three areas. In central Europe, an early focus on caprines gives way to an emphasis on cattle, with regionally varying contributions of wild resources. In Ukraine, indigenous groups gradually adopt domesticates, and a similarly piecemeal and protracted process is also evident in the Baltic, our final case study (e.g. [Zvelebil and Dolukhanov 1991](#); [Zvelebil and Lillie 2000](#)). Throughout the area, summers are cooler and precipitation heavier than in the Balkans or the middle Danube Basin, and winters are colder in general ([Barker 1985](#), 135). Postglacial foragers exploited the rich fauna in mixed forests and open woodland and grassland habitats on loess soils.

CENTRAL EUROPE

Central Europe shows little evidence of ‘complex’ foragers (Milisauskas 2002, 153–155), and the archaeological record suggests that early farming cultures, such as the Starčevo/Körös/Criș and Linearbandkeramik (LBK), are intrusive. This section contrasts sequences from Hungary, Poland, and Switzerland to illustrate the variability in the uptake of domesticates.

The Danube valley probably served as a key Neolithic ‘gateway’ between the Balkans and the Carpathian Basin. One of the best studied sites, Lepenski Vir on the Serbian side of the Iron Gates, with its unusual deposits of wild animal remains (Dimitrijević 2008), does not look typical of cultural developments at the Mesolithic–Neolithic transition. Whilst Mesolithic evidence is extremely scarce in the Carpathian Basin, Neolithization here probably expanded from the Balkans, as variants of the Starčevo/Körös/Criș culture reached the middle Danube at c. 6200–6000 BC (Whittle et al. 2002, 107–117), during a presumed climatic optimum. Caprines were definitely introduced, as domestic sheep and goat had no wild ancestors in Europe (Bökönyi 1978).

It has been suggested that husbandry and hunting were of similar importance in Körös culture subsistence. However, assemblages with over 1,000 identifiable bones from Hungary and Serbia almost invariably contain 60–80% caprine remains, some cattle, but only little pig, dog, or game (Bartosiewicz 2005, 52). Romanian Criș assemblages reinforce this impression (El Susi 2007, 30; Bindea 2008). In contrast, the importance of hunting is often argued on the basis of small, atypical assemblages. Apparently, Körös herders lived in dispersed hamlets and maintained near-monocultural sheep husbandry for some 300 years, although sheep may have been ill adapted to the marshy environment. These early communities hardly ever hunted and rarely even gathered shed antler for tools (Makkay 1990; Choyke 2007). Opportunistic fowling, including the probable use of feathers and the gathering of eggs, was a constant feature of Neolithic subsistence in the floodplains of Hungary and Romania (Gál 2007), and aquatic resources were consistently exploited. Early Neolithic communities gathered small carp-like fish, pike, and mussels in residual flood pools (Bartosiewicz 2007), whilst by the late Neolithic bone and boar tusk hooks and antler harpoons indicate active fishing (Choyke and Bartosiewicz 1994).

During the middle Neolithic (c. 5600–5000 BC), the contribution of pig remains becomes comparable to that of caprines in the Hungarian Plain (Bartosiewicz 2005, table 6.1). This may indicate a late trend towards local domestication of wild pigs, as mtDNA analyses suggest

for other parts of Europe (Larson et al. 2007, 15276). Bökönyi (1985) hypothesized a late Neolithic cattle ‘domestication fever’ in Hungary around 5250–4250 BC, but mtDNA shows that the Körös aurochs population was genetically separate from domestic cattle of Near Eastern origins (Edwards et al. 2007, 329). Aurochs hunting became significant during the late Neolithic, although animal keeping was already well-established. Contemporary settlement structures, including tells, reflect a complex social organization, possibly making hunting an important way of confirming social status. Prestige objects (Siklósi 2004) such as boar tusks and stag canine pendants, and the bone imitations of the latter (Choyke 2001), also show the increasing cultural importance of game in the south-eastern Carpathian Basin.

Early farming communities of the LBK (c. 5600–4900 BC) may have been very mobile, and cattle dominate faunal assemblages (see Bickle and Hofmann 2007 and references therein). This shift away from caprines towards cattle and pig is probably an adaptation to differing environmental zones (i.e. Balkans versus central Europe), but may also be determined by varying attitudes towards available species, differing management requirements, and differences in meat yields and secondary products.

In the lowlands of northern Poland and north-eastern Germany, less substantial post-built structures take the place of the characteristic longhouses of the loess (seen as related to storage). Subsistence is based primarily on cattle, with pig and caprines occurring at significant frequencies. Cereals are dominated by emmer and a proportion of the diet is obtained from wild resources (terrestrial and aquatic) (Bogucki and Grygiel 1993). Milisauskas (2002, 162) suggests that the role of hunting has been underplayed. LBK studies in Germany have long benefited from the analysis of subsistence (Lüning 1991, 2000), with ground-breaking general work by Müller (1964) followed by more detailed analyses in the upper Danube catchment (Pucher 1987; Uerpmann and Uerpmann 1997).

Later LBK faunal assemblages in the German and Polish lowlands, as well as in the Eneolithic of Slovakia (Ambros 1986) and Hungary (Bökönyi 1961–1963), are discussed under the general heading of the Lengyel culture. Long-term agricultural settlements, with the characteristic trapezoidal longhouses, do not occur until c. 4400 BC in central Poland (Bogucki and Grygiel 1993, 414). In contrast to the conventional wild/domestic dichotomy, Marciniak (2005, tables 7.1 and 8.1) has studied differences in carcass treatment between domesticates at LBK sites in Kujavia and Małopolska. He observed differences between cattle and pigs on the one hand and sheep and goats on the other. Lengyel culture sites in Kujavia and Wielkopolska show a different pattern and more hunting, a trend seen elsewhere in

central Europe. In the north, animal exploitation by people of the Funnel Beaker (TRB) culture is discussed in general terms by [Midgley \(1992, 369–384\)](#). She has shown that hunting played an important role in the economy, but this was more pronounced in the north than in the TRB's more southern and south-eastern areas. Environmental (predominance of loess in southern regions) and possibly even cultural factors influenced this situation. [Midgley \(1992, 375–376\)](#) characterizes the TRB economy as based on mixed farming, supplemented by hunting and gathering. In general, red deer dominate the wild fauna and cattle the domesticated element, but as might be anticipated there are inter-regional and inter-site differences, and the relative proportion of wild resources decreases towards the later TRB ([Midgley 1992, 377](#)). More recently, [Marciniak \(2005\)](#) has traced the dynamic development of middle Neolithic farming and its stabilization in the Funnel Beaker territory from an ethnologically informed perspective, wherein interpretations of animal exploitation are embedded in a theoretical discourse on the role of animals in the everyday social structuring of farming communities. This work has moved beyond the fundamental aspects of animals as elements of subsistence strategies and explores amongst other things themes of agency, identity, and space and place. Fundamentally, however, it provides a similar, albeit more nuanced picture of the TRB culture as developed by Midgley. Both offer important insights into the nature of continuity and change from the earlier Neolithic to the cultural developments that characterize the TRB.

In late Mesolithic Switzerland (6700–5500 BC), there is no evidence of domesticated animals, but pollen data and macrofossils suggest minor pre-Neolithic agricultural activity on the Swiss Plateau ([Haas 1996; Tinner et al. 2007](#)). The lack of high resolution scanning in the identification of *cerealia* in earlier work means caution should be exercised here ([Edwards and McIntosh 1988](#)). However, responding to [Behre \(2007\)](#), [Tinner et al. \(2008, 1468\)](#) argue that 'relying uniquely on the pollen signal, the onset of the Neolithic in Switzerland would be placed at *ca.* 6700 cal. BC, which indeed is in contradiction with the conventional paradigm in archaeology', which dates the onset of the Swiss Neolithic to *c.* 5500–5200 BC ([Tinner et al. 2007](#)). Imported sea shells indicate Mediterranean contacts along the Rhône ([Nielsen 1997](#)), and the concept of agriculture could have arrived along the same route. Domesticates occur from 5500 BC, whilst pollen diagrams show 'conventional' Neolithic cultivation at *c.* 5400–5000 BC. On the Swiss Plateau, Neolithic deforestation is evident in the palynological record at around 4400–4000 BC, as lakeshores were being settled ([Erny-Rodmann et al. 1997; Nielsen 1997, 2003](#)). Agriculture dominates subsistence only after *c.* 4500 BC ([Stöckli 1998](#)).

Waterlogged deposits at pile-dwellings have enriched this picture, and were key for developing archaeozoology and archaeobotany as disciplines (Rütimeyer 1861; Heer 1866), but these sites date mostly to the late Neolithic (c. 4300 BC).

Whilst proportions between domestic animals vary between eastern and western Switzerland, at around 3900 BC and after 3750¹ BC red deer bone reaches around 60% in food refuse (Schibler et al. 1997, 178–179), apparently due to an agricultural crisis visible in declining grain harvests and the increasing contribution of wild plants (Jacomet 2007). This is also reflected in raw material management in occupation layers dendro-dated to 4300–2571 BC. At earlier settlements (4300–3100 BC) bone tools were common, and antler originated from both hunting and gathering. Antler sleeves, used as shock absorbers between the stone axe blades and wooden handles, attained importance during the fourth millennium BC. Later inhabitants increasingly gathered shed antler (Schibler et al. 1997; de Capitani et al. 2002), a sign of systematic raw material management. Juvenile deer significantly contributed to assemblages around 3600 BC, possibly indicating over-hunting. By 3100 BC, even small antler tines were manufactured into sleeves and commonly curated (Schibler 2001, 85–87). Corded Ware levels (c. 2750 BC) yielded significantly more antler sleeves, but red deer bone became minimal. These changes show the subtle interplay between technical innovation, shifting subsistence patterns, and environmental change.

As a long-term trend throughout central Europe, Sherratt (1983) suggested a shift to the ‘secondary’ production of milk, wool, and animal labour, supporting increasing social complexity. However, the earliest use and functions of these products represent different motivations. Milk and wool utilization seemingly began earlier than animal traction (Lüning 1979/80). Caprine or cow milk residue has been detected on sherds from early Neolithic Ecsegfalva in Hungary and Schela Cladovei in Romania (Craig et al. 2005), and whilst the diffusion of dairying into the rest of Europe remains debated, biochemical evidence is available from middle Neolithic France (Chasséen Septentrional culture; early fourth millennium BC) (Balasse et al. 1997) and late Neolithic Switzerland (3384–3370 BC) (Spangenberg et al. 2006). By the end of the Neolithic, finds from waterlogged contexts, such as a yoke fragment from Switzerland (Jacomet and Schibler 2006, 142, fig. 1) and a wheel with axle from Slovenia (Velušček 2006), coincide with the increase of articular disorders in cattle, partly related to draught exploitation (Bartosiewicz 2006). Ploughing and wheeled transport enabled increased agricultural production, facilitating the accumulation and redistribution of surplus.

It is still valid that often ‘the first appearance of pottery and polished stone tools is taken as automatic evidence that hunting and gathering had been replaced by farming’ (Dennell 1985, 153; see also [Telegin 1987](#); [Jacobs 1993](#); [Lillie 1996](#)). Yet generally in Ukraine there is continuity between the Mesolithic and early Neolithic.

Thus, the sixth millennium BC Bug-Dniester culture, originating in the forested valleys of the Bug, Dniester, and Prut rivers ([Zvelebil and Dolukhanov 1991](#), 252) and extending across Moldova and into Ukraine ([Dergachev et al. 1991](#)), continued using Mesolithic lithic industries. Hunting, fishing and gathering constitute the main subsistence elements. Remains of wild pig, red and roe deer, fish, and edible molluscs (riverine mussel) are common. In addition to collected food, there is evidence for the extensive use of grasses and some exploitation of domesticates ([Zvelebil and Dolukhanov 1991](#), 260). Subsistence data have been recovered from 11 sites in the southern Bug and Dniester valleys ([Zvelebil and Lillie 2000](#), 74). Domestic animals are probably imported in the earlier stage of the culture (accounting for <20% of faunal assemblages), sheep and goat are generally absent ([Tringham 1971](#), 98), and wild plants are gathered (possibly with some management/cultivation?) ([Zvelebil and Lillie 2000](#)). The incorporation of domesticates into subsistence strategies is uneven and piecemeal between c. 5700–5000 BC. Even in the latest stages of the Bug-Dniester culture, domesticates seldom exceed 50% of the assemblages ([Telegin et al. 2003](#)), although [Milisauskas \(2002, 150\)](#) suggests an agricultural component from as early as c. 6000 BC.

Artefacts and economic evidence indicate contacts with the Körös-Criş and LBK farming communities to the west and north-west ([Dolukhanov 1984](#), 341) during the second stage of the Bug-Dniester culture, whilst early Bug-Dniester sites are contemporary with pre-Körös-Criş groups ([Kotova 2003](#)). At c. 6200 BC, Körös-Criş sites in Romania and Moldova exhibit features with Mesolithic antecedents in stone and bone tool technology, domestic architecture, and economy ([Zvelebil and Lillie 2000](#), 72). In general, the numbers of domesticates on these sites are somewhat lower than in areas further south and south-west ([Tringham 1971](#); [Demoule and Perlès 1993](#); [Perlès 2001](#)) or within the Carpathian Basin, and wild plants, and occasionally animals, are significant components of the subsistence economy. Faunal assemblages at the Criş site of Sakarovka on the right bank of the Solonets, which ultimately drains into the Dniester, include pig, red deer, and cattle, with some caprines, roe deer, elk, and wild horse as subsidiary components. Whilst cereals were not recovered, sickles suggest possible cultivation, or at least the harvesting of wild grasses

(Dergachev et al. 1991, 10).

East of the Bug-Dniester cultural area, the Dnieper-Donets culture also developed from Mesolithic groups (Telegin and Titova 1998; Telegin et al. 2002). At later Mesolithic sites in the Dnieper region (e.g. Kukrek culture), ceramics are associated with Mesolithic type lithics, indicating that Mesolithic groups are influential in the development of the 'Neolithic' here (Zaliznyak 1997). The earliest Neolithic element is the Surskaia culture (also sometimes spelled Sursko or Surskii) dated to c. 6200 BC (Telegin et al. 2003), which extensively exploits the rich fish resources of the Dnieper, along with some domesticated cattle and pig (Telegin 1987, 318). Kotova (2003) offers a detailed re-consideration of culture groupings in the Ukraine.

The Dnieper-Donets culture (including its Mesolithic precursors and its variants) has been the subject of a considerable number of new dating, dietary isotope, and palaeopathological analyses aimed at understanding subsistence throughout its development (c. 5500–4000 BC) (Telegin et al. 2002, 2003; Lillie 1996, 1998; Lillie and Richards 2000; Lillie et al. 2003, 2011; Lillie and Jacobs 2006). Of the over 800 Mesolithic and Neolithic skeletons recovered (Konduktorova 1974, 12), the c. 300 suitably preserved examples have provided important insights into chronology, diet, and subsistence across the Mesolithic-Eneolithic periods (between c. 7000–3700 BC). Recent dating work (Lillie et al. 2009) has also included evidence from mammalian and fish remains from middle and lower Dnieper basin sites. This has shown that freshwater resources (e.g. carp and pearl roach) are influencing the radiocarbon determinations obtained on human bone, with preliminary evidence of a freshwater reservoir effect across the Mesolithic–Neolithic transition (similar to the Danubian Iron Gates; Bonsall et al. 2000) and across the Neolithic to Eneolithic periods. At c. 5100 BC, sites such as Dereivka I and Yasinovatka show a marked offset between terrestrial mammal, human, and fish samples from the same burial context. Offsets between human and red deer samples span c. 250 radiocarbon years at Dereivka I and c. 470 years at Yasinovatka (Lillie et al. 2009). Thus, previous dates on human remains from the cemeteries of the Dnieper Basin could be several centuries too old at the onset of the Neolithic, a situation also observed at Schela Cladovei, downstream from the Danubian Iron Gates in Romania (Cook et al. 2002, 81).

The increased levels of freshwater resource consumption by the hunter- fisher-gatherers in the valleys of the Dnieper and Donets systems could be a socio-economic 'buffering' reaction against the new resources (i.e. domesticates) becoming available at this time through, for instance, population movements along the Black Sea coast and the expansion of agricultural communities (Anthony 2007; Dolukhanov

and Shilik 2007). At the Dnieper Rapids cemeteries—similarly to those in the Iron Gates—later Mesolithic populations consumed a greater proportion of freshwater resources compared to early Neolithic groups (Fig. 21.2). The late Mesolithic population consumed terrestrial resources (e.g. red deer, roe deer, horse, wild boar) with a significant input from freshwater fish, with the contribution of the latter lessening slightly in the early Neolithic, although the broad range of wild animal species continued to be exploited into the Neolithic period, alongside cattle, caprines and pig. There is evident variability in individual diets, but this is not unusual, as different subsistence regimes are to be expected where social situations may have been mediated through the procuring, allocating, and controlling of resources (Lillie 2003).

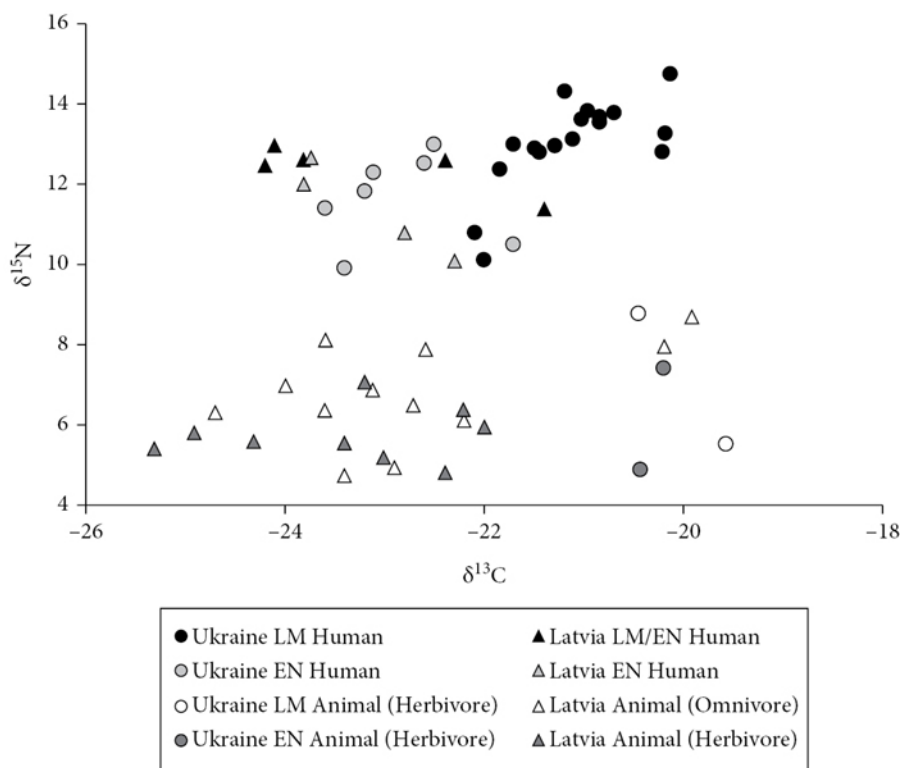


FIG. 21.2. Stable isotope analysis of Ukrainian (Vasilyevka II, Marievka, Dereivka, and Yasinovatka) and Latvian (Zvejnieki) late Mesolithic (LM) and early Neolithic (EN) human and faunal remains (after Lillie and Jacobs 2006; Budd et al. in press; Eriksson 2006; Eriksson et al. 2003).

During the Neolithic period, the stable isotope ratios for Yasinovatka (Lillie et al. 2009, table 5) demonstrate higher $\delta^{15}\text{N}$ values than those from Dereivka I. At 11.4–13‰, these ratios are closer to those from the Danubian Iron Gates sites ($\delta^{15}\text{N}$ at c. 14 or

15‰, and $\delta^{13}\text{C}$ at c. -23‰), which for [Bonsall et al. \(1997\)](#) indicate a diet based heavily on river fish. Stable isotope analyses on the populations of the middle and lower Dnieper basin are ongoing, but significantly, the freshwater reservoir effect so far seems dissipated towards the Neolithic–Eneolithic transition (c. 4500–3700 BC) ([Lillie et al. 2009](#)), perhaps reflecting the increasing importance of domesticates (predominantly animals, i.e. cattle, pig, and caprines). Recent debate regarding the adoption of domesticated cereals in Dnieper-Donets stage II primarily revolves around seed impressions (wheat and barley) in pottery fabrics (e.g. [Kotova 2003](#)). However, at present, the available evidence is insufficient to indicate that domesticated cereals formed an important element in subsistence during the earlier Neolithic period (see e.g. [Motuzaite Matuzeviciute et al. 2009](#); [Motuzaite Matuzeviciute 2012](#)).

Towards the middle Neolithic, and the Eneolithic/Copper Age in Ukraine, Moldova, and Romania, the Tripolye culture (Trypillia in Ukrainian) develops through a combination of initial influences from the Balkan-Danube region and later Neolithic contacts with the Körös and Turdaş cultures ([Lillie 2008](#); [Korvin-Piotrovskiy 2008](#)). The Trypillia subsistence economy is based on the husbandry of cattle, caprines, and pigs, alongside cultivation of wheat, barley, millet, and legumes. Gathering, hunting, and fishing occur everywhere, and at some sites, such as Kolomyishchina II, wild animals make up a significant proportion of the assemblage ([Lillie 2008](#), 14). This situation resonates with the idea of the hybridization of mixed hunter-gatherer/farming groups at frontier zones during the initial expansion of agriculture (e.g. [Thomas 2004](#); [Zvelebil 2006](#)), although the Trypillia culture is relatively unique due to the development of ‘mega-sites’, such as Nebelivka, Talljanki, and Maydanetskoe, which contain up to 1000 buildings ([Kruts 2008a](#), [2008b](#)). The central European TRB also occurred in Ukraine at this time, and, as with many central European middle Neolithic communities, its economy is characterized by mixed agro-pastoralism with wild fauna contributing to varying degrees ([Milisauskas and Kruk 2002](#), 209).

THE BALTIC REGION

Recent research in the Baltic Sea area, particularly Lithuania, Latvia, and Estonia, has provided significant insights into the development of Neolithic agriculture ([Antanaitis-Jacobs et al. 2009](#)). In the Mesolithic, similar hunter-fisher-gatherer economies persisted around the Baltic, with some regional differentiation in the later Mesolithic. The larger cemetery sites, such as Skateholm, Vedbæk, Zvejnieki, and

Oloneostrovskii Mogilnik, appear at this time (Timofeev 1998, 44).

One of the cemeteries, Zvejnieki in Latvia, has recently been investigated in relation to prehistoric diets (Eriksson et al. 2003). The 2,446 tooth pendants recovered indicate that elk dominates, with wild boar, red deer, dog, aurochs, and seal also present. These species are just part of the range of fauna from the Zvejnieki complex, where beaver, marten, badger, wild horse, otter, brown bear, fox, wolf, wild cat, wildfowl, fish, and caprines are all attested. For instance, the settlement produced pike, perch, a range of cyprinids (bream, tench, asp, carp), wels, eel, and some salmon (Eriksson et al. 2003, 5–7). Stable isotope analyses show considerable variability in diets across the late Mesolithic to the end of the middle Neolithic (c. 5600–3500 BC), with an emphasis on terrestrial/freshwater animals (Fig. 21.2). Human isotope values cluster in two groups, one with a diet similar to that of the otters analysed in this study, the other displaying a mixed freshwater fish and hunted animal diet (Eriksson et al. 2003, 12). Overall, Mesolithic and early Neolithic populations consumed more freshwater fish than individuals in later periods.

Antanaitis-Jacobs et al.'s work (2009) reinforces the observation that hunter-fisher-gatherer subsistence strategies persist into the Neolithic, and in general, the only defining Neolithic 'signature' in the east Baltic is the appearance of pottery at c. 5600–5400 BC in Lithuania and Latvia (Antanaitis 1999, 89). Domestic cattle, caprines, and pigs are present at middle Neolithic sites in Lithuania and Latvia, although at relatively low levels of c. 6–18% in terms of the number of identified species (Antanaitis-Jacobs et al. 2009). The Lithuanian record indicates that the hunting of elk, red deer, aurochs, boar, marten, and beaver, alongside seal, persisted into the Neolithic (when seal exploitation actually increases) (Antanaitis-Jacobs et al. 2009, 13). Only in the Bronze Age do domesticates begin to dominate faunal and floral assemblages (Antanaitis 1999, 2001).

Evidence for cereals is generally sparse in the east Baltic, although there are single finds of oat, barley, *Cerealia*, and hemp/hops from middle Neolithic contexts (Rimantienė 1992, 98). Indeed, the first domesticated plant recorded in western Lithuania at c. 3300–2000 BC is hemp (Antanaitis et al. 2000, 49). Overall, the most prolific plants on Mesolithic and Neolithic sites are the 'ubiquitous' hazelnuts and water chestnut (Antanaitis-Jacobs et al. 2009, 15). Later Neolithic finds additionally include cultivars such as emmer, barley, and millet. To enhance the resolution of the Lithuanian palaeobotanical record, Antanaitis et al. (2000; Antanaitis and Ogrinc 2000) investigated two habitation sites, Kretuonas in north-eastern Lithuania and Turlojiškė, located c. 250 km to the south-west. Both of these sites represent a palimpsest of activity, with habitation and burial features and some

partially waterlogged elements. A combination of subsistence strategies is also in evidence (Antanaitis-Jacobs, pers. comm. 2012). There are both Neolithic and Bronze Age contexts at each site, and these predominantly yielded wild species such as raspberry, apple (?), and hazelnuts. Unfortunately, of the 166 samples analysed only one contained evidence for domesticated plants, this being millet from Turlojiškė (Antanaitis et al. 2000, 56–57). In general, wetland/aquatic species dominated these assemblages, reflecting the surrounding natural environments, although at least a proportion of the material was likely gathered by the groups occupying these sites (e.g. Nicholas 2007). Whilst the sampling methodology needs further refinement, Antanaitis et al. (2000) note that these data support the late introduction and small-scale exploitation of domesticates in Lithuania.

Whilst palaeoenvironmental research in Estonia continues to develop, the study of early agriculture is still relatively under-developed (Poska and Saarse 2002). However, in north Estonia there is evidence for cereals in pollen records at c. 4500 BP, and barley and wheat were integral to the economy by c. 2300/2200 to 1600/1500 BC (Poska and Saarse 2002, 555). This suggests that ‘primitive’ agriculture occurred on Saaremaa Island as early as c. 4500 BC, at the onset of the Neolithic. In Neolithic inland Estonia, much as in the Mesolithic, elk, wild boar, and aurochs were hunted, whilst at coastal sites marine resources were exploited (Lõugas et al. 1996, 399f). Later Neolithic subsistence practices are mixed, with seal hunting and fishing on the coast, and some use of domestic cattle alongside crop cultivation. The diversity of environmental and ecological characteristics around the Baltic clearly results in a protracted and piecemeal adoption of the agricultural economy across the Neolithic through to the Iron Age period (e.g. Zvelebil 2006).

DISCUSSION

As might be anticipated, many factors influence the rate of spread, integration, and ultimate adoption of domestic animals and plants across Europe as ‘farming’ was disseminated. The evidence presented here reinforces this observation and highlights the fact that even at the intra-regional level, significant variation in Neolithic economies can occur.

To some degree, regional variation in topography, soils, drainage, etc. influenced the choices of domesticates exploited in the earlier Neolithic. However, it is now generally accepted that socio-political aspects and even cultural beliefs and practices came into play when individuals and groups chose to adopt parts of the new farming

package. As a consequence of domestication, it appears that animals and plants became integrated into material culture inventories as artefacts. Domestication itself is an artificial process. As such, the choice to 'opt in to' a particular combination of species, alongside decisions on how to tend, display, and consume them, reflect the needs, tastes, and aspirations of incipient farmers. However, various cultures also developed their own cognitive, linguistic, and cultural systems to deal with the non-physical world, and these general attitudes would also have impinged on the significance of animals in a given society. These elements tend to be unique, and often virtually impossible to compare due to the diversity of forms of expression, whether this be verbal, behavioural, or concerning material culture. The diversity that is evident in the spread and adoption of farming practices and products is, most probably, embedded in metaphorical connotations that are intangible today.

Overall, however, diversity in subsistence practices unquestionably increased and the material consequences of the choices made need to be documented in a rigorous and scientific manner. Additionally, in order to facilitate a holistic understanding of Neolithic subsistence strategies, detailed regional knowledge is also required. Fortunately, the available literature has expanded considerably in recent years, and researchers can now further develop an inductive overview, as has been attempted here.

Finally, in addition to the increased political opening-up of central and eastern Europe since the 1990s, enhancing international academic exchange, the twenty-first century has also brought a flurry of methodological innovations and analytical techniques, such as serial AMS dating, isotope studies, and DNA analysis (e.g. [Ambrose 1993](#); [Bonsall et al. 1997](#); [DeNiro 1985](#); [Lubell et al. 1994](#); [Richards 1998](#); [Schoeninger et al. 1983](#)), which offer new insights into ancient subsistence strategies. Whilst there are still inherent limitations and areas in need of further refinement, it is obvious that integrating multiple strands of evidence will enhance our understanding of past diets through development of a holistic and nuanced perspective on the transition to agriculture throughout Europe.

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NOTES

1. Dates after around 3900 BC in Switzerland are generally based on dendrochronology.

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CHAPTER 22

SUBSISTENCE PRACTICES IN WESTERN AND NORTHERN EUROPE

PETER ROWLEY-CONWY AND TONY LEGGE†

INTRODUCTION

THIS chapter considers domestic animals and plants in the Neolithic of western and northern Europe. Perhaps no other region on the planet has seen research as intensive and as long term, but despite this the nature and significance of early agriculture is still keenly debated. There is little agreement even on many of the basic issues: how rapidly was agriculture established as the dominant way of life in the various parts of the region? In what proportions did immigrant farmers and indigenous foragers contribute their genes to Europe's later population? Were any of the major plants or animals locally domesticated? Our information often remains patchy and sometimes contradictory, but current work is transforming our understanding of these issues.

We start with the northern and western parts of the Linearbandkeramik (LBK). This farming culture originated in the Hungarian Plain c. 5700 BC, and spread west to the Paris Basin in a couple of centuries ([Schier](#), this volume). This parallels the very rapid near-contemporary Cardial farming spread round the central and western Mediterranean coasts ([Bogaard and Halstead](#), this volume). West of the Alps, the two axes slowed and converged, and farming reached the Biscayan coast of France by c. 5000 BC. To the north of the LBK, the spread of farming stopped for 1,500 years, after which it again spread remarkably rapidly at c. 4000 BC, reaching Ireland, Scotland, and Scandinavia as far north as Oslo and Stockholm.

ENERGETICS

Hunter-gatherers are often (but not always) mobile, exploiting seasonal resources in different places. Large-scale food storage is rare.

Farming systems imposed quite different needs. Neolithic farmers made their living mainly from their domestic animals and plants, and these involved much smaller areas of land. Cereals were grown in small fields cleared of vegetation, no doubt initially assisted by rooting domestic pigs. The domestic animals were closely managed. Food storage was the key to the growth and dispersal of the Neolithic way of life. The farmers would have stored substantial amounts of cereals and processed milk products. This imposed a largely sedentary life, with people tied to their fields and food stores. Farming thus brought about profound social change.

Neolithic farming could extract much more energy from a given area than foraging. Hunter-gatherers usually gain about 10–15 times more food energy than they expend obtaining it. Traditional farmers do better, gaining 20–40 times the energy they expend (Leach 1976). One Neolithic family could satisfy their food needs from the cultivation of just a couple of hectares. A hypothetical farming village of 100 people would utilize perhaps 150–200ha, though grazing would use additional land. The population density of farmers on suitable land would clearly be very much higher than that of hunter-gatherers.

Farming thus brought about a profound change in population density. Most hunter-gatherers have low population densities, due to the constraints of lean seasons (Rowley-Conwy and Layton 2011). The situation has been quite different in farming societies. Sedentary groups can wean children much earlier, because stored cereals and milk products provide ideal weaning foods; in consequence each woman could have multiple births. The parish records of British villages reveal that only a century or two ago families of 10, 12, or even more children were quite common. Once farming was firmly established, there was no return to earlier ways.

METHODS AND INTERPRETATIONS

Neolithic agriculture is studied through the remains of the animals and plants themselves. Preservation and recovery of these is problematic: animal bones often preserve fairly well unless soil conditions are too acidic, whilst plant tissues normally decay rapidly. On most European farming settlements we only see plant remains that have been exposed to fire and which survive by charring, a taphonomic window that it is vital we bear in mind.

The differential size of bone fragments means that excavated samples may be biased: excavators using trowels will find most cattle bones, but fewer sheep and even fewer chicken bones. A sieving

regime is thus a vital ingredient of any excavation strategy (Legge and Hacker 2010). This should include sub-sampling with a smaller mesh to find very small bones; only a 1mm sieve mesh will recover small fish such as herring in the proper proportion (Enghoff 2011, table 41).

Charred plant remains are more difficult to recover systematically. A burnt cereal store is usually visible during excavation, but lower-density samples such as those in middens or back-filled pits are not. Hazelnut shell fragments are more visible than cereal grains. Such factors are clearly likely to lead to bias. A systematic approach to recovery by flotation is therefore essential, preferably done on a large scale during the excavation itself. Various kinds of recovery unit are employed (Jarman et al. 1972). A consistent regime such as sampling 10% of all contexts should be the norm (van der Veen and Fieller 1982).

Even optimally recovered samples must be interpreted—these data do not ‘speak for themselves’. We must always remember that Neolithic farmers did not deliberately create an archaeological record for our benefit. The animal bones are the discarded waste products from successful human utilization of animal products. Plant remains may survive accidentally—the accidental burning of a cereal store—or incidentally—the discard of waste products (weeds, chaff, nutshell) into a fire. Samples of 1,000 animal bones and 1,000 charred plant fragments tell very different kinds of story: the animal bones probably accumulated over a period of time, as individual animals were slaughtered and consumed, whilst the plant fragments may have been burnt in an episode taking only moments. The animal bones from a site therefore present an averaged picture of the economy, whilst numerous plant samples from the same site each present a snapshot of economic activity.

The way this affects interpretation is shown by the British Neolithic samples in Fig. 22.1. The animal assemblages are remarkably consistent, suggesting that the animal economy was cattle-based in southern England at least. The predominance of pig on late Neolithic sites is a major change resulting from a different mode of animal consumption (Serjeantson 2011; Rowley-Conwy and Owen 2011). The plant remains are however much more variable. The late Neolithic samples from Scord of Brouster comprise a ‘house floor’ sample, almost entirely edible barley, perhaps an accident during food preparation, and a ‘hearth’ sample, predominantly inedible weeds and chaff. Cereals need processing to separate them from these waste products (Hillman 1981). The final fine sieving removes small weed seeds and chaff fragments. The ‘hearth’ sample is probably this kind of waste, disposed of into the fire by which the barley processor sat.

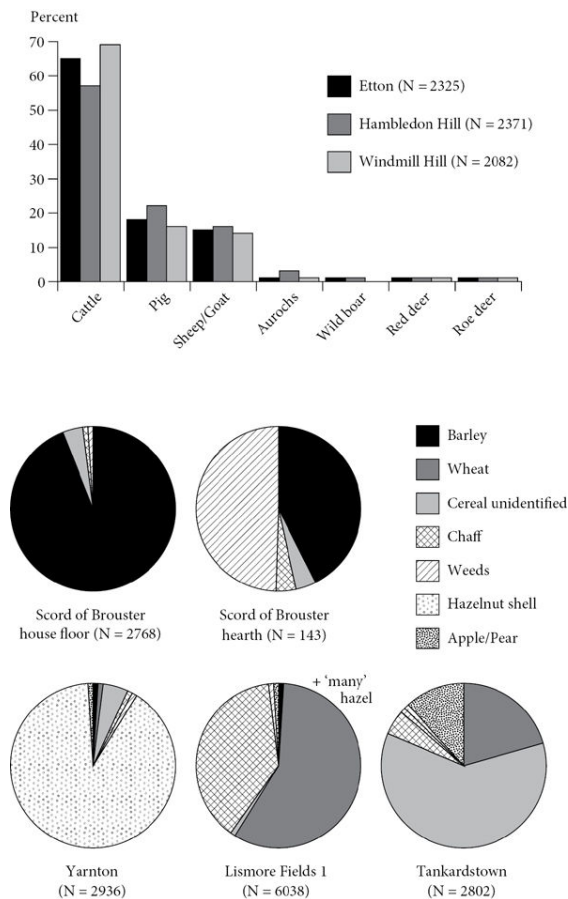


FIG. 22.1. Economic remains from selected British Neolithic sites. (a) Histogram showing relative frequency of the main food mammals at three early Neolithic sites. (b) Pie charts showing relative frequency of charred plant remains. Bones: Windmill Hill calculated from Grigson (1999, Tables 145.1–3), summing pre-bank and early Neolithic contents, excluding ribs and antler. Hambledon Hill main enclosure ditch from Legge (2008, Tables 8.6 and 8.7), assuming 3.3% of cattle are wild (cf. 1 of the 30 metacarpals plotted in fig. 8.3) and 5.3% of pigs were wild (cf. 1 of the 19 measurements listed in Tables 8.33 and 8.34). Etton summed from Armour-Chelu (1998, fiche tables 75 and 58–60). Plant remains: Scord of Brouster from Milles (1986, fiche tables 27–28); ‘house floor’ is total of samples 79–82, ‘hearth’ is total of samples 56–58, Yarnton from Robinson (2000, Table 8.1), Lismore Fields 1 from Jones (in Jones and Rowley-Conwy 2007, Table 23.1), Tankardstown from Monk (1988, 186–187).

Wild pigs and cattle were present in Neolithic Europe, and separating wild from domestic can be problematic. In both species, wild were larger than domestic, but sexual dimorphism in cattle means that Neolithic wild females are about the same size as domestic males, which can pose a challenge. Pigs are not sexually dimorphic but have other problems: they are often supposed to have been loosely

herded by Neolithic farmers, so bones of feral and mixed specimens may occur. The size range in a single population is however quite well understood ([Albarella and Payne 2005](#)), and a recent survey has shown that most European Neolithic pigs were in fact close-herded and fully domestic ([Rowley-Conwy et al. 2012](#)).

Dairy products were important. Before Neolithic times, humans would seldom consume milk after weaning. To digest milk, young mammals produce the digestive enzyme lactase until they are weaned. Some humans however continue to produce lactase into adult life, particularly in northern Europe, which allows them to consume milk throughout their lives. Some zooarchaeologists have argued that this was post-Neolithic adaptation. However, the gene for continued lactase production occurs in Neolithic humans from Sweden ([Malmström et al. 2008](#)), and lipids from milk have been found in Neolithic pottery ([Evershed et al. 2008](#)). The cattle bones themselves have long been argued to show dairying ([Legge 1981](#)). The clearest zooarchaeological example is the Bronze Age site of Grime's Graves ([Fig. 22.2](#)). In dairy herds, most male cattle are killed shortly after birth, to free the milk for human use. The adult herd thus consists largely of the breeding and lactating females. At Grime's Graves many animals were killed very young, seen in the steep reduction in 'per cent survival' next to the vertical axis in [Fig. 22.2a](#). Jaws cannot be sexed, so sex ratios among older animals are established through limb bones. Distal humerus and distal metacarpal, which fuse at 12–18 months and 24–30 months respectively, show that by these ages the herd already consisted mainly of females ([Fig. 22.2b, c](#)). The high kill in the first couple of months ([Fig. 22.2a](#)) must therefore comprise the missing males.

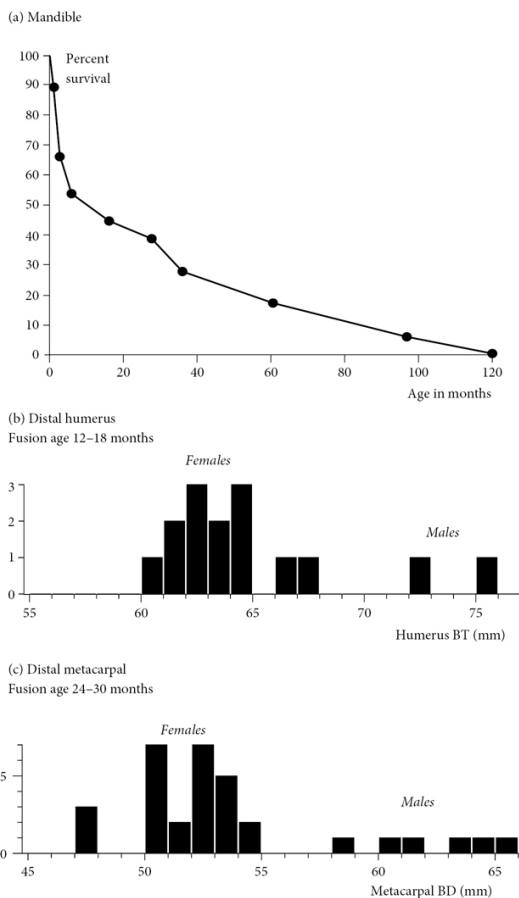


FIG. 22.2. Age and sex of the cattle from Grime's Graves, showing the evidence for dairy production. Top: mortality curve based on the mandibles (data from [Legge 1992](#), Table 6d). Middle and bottom: dimensions of fused distal humeri and distal metacarpals, with tentative sexual division (data from [Legge 1992](#), Appendix 1). Measurements as defined by [von den Driesch \(1976\)](#).

THE NORTHERN AND WESTERN LBK

The rapidity of the LBK spread across the loess soils of central Europe is no longer put down to shifting cultivation. European soils do not lose their fertility after a couple of years, so there would be no need to move to a new location ([Lüning 1980](#); [Rowley-Conwy 1981](#)). LBK people lived in permanent and quite widely dispersed settlements. Thick forest faced the colonists, inhibiting their ventures, so the LBK may have spread by boat, along the major rivers where the earliest settlements are found ([Rowley-Conwy 2011](#)). There would have been few natural clearings, although some areas along watercourses may have been clear of forest ([Kreuz 2008](#)).

Although LBK settlements were surrounded by forest, farmers made remarkably little use of its products. The animal bones are dominated by domestic animals. [Figure 22.3](#) presents three examples spanning the LBK's northern edge from Paris to Poland. Cattle predominate, because they cope relatively well with forest grazing. This was a new development in the European Neolithic: farmers to the south-east relied on sheep and goats as their main domesticate. LBK farmers reconfigured the animal economy for the central European forest environment. Pigs were also suited to this forest, but they were not common, often being outnumbered by sheep. This suggests that the animal economy was centred on the farming clearings themselves: the wild and domestic pigs remained of different sizes, suggesting there was little interbreeding between the two. Domestic pigs were evidently close-herded near the settlements ([Rowley-Conwy et al. 2012](#)).

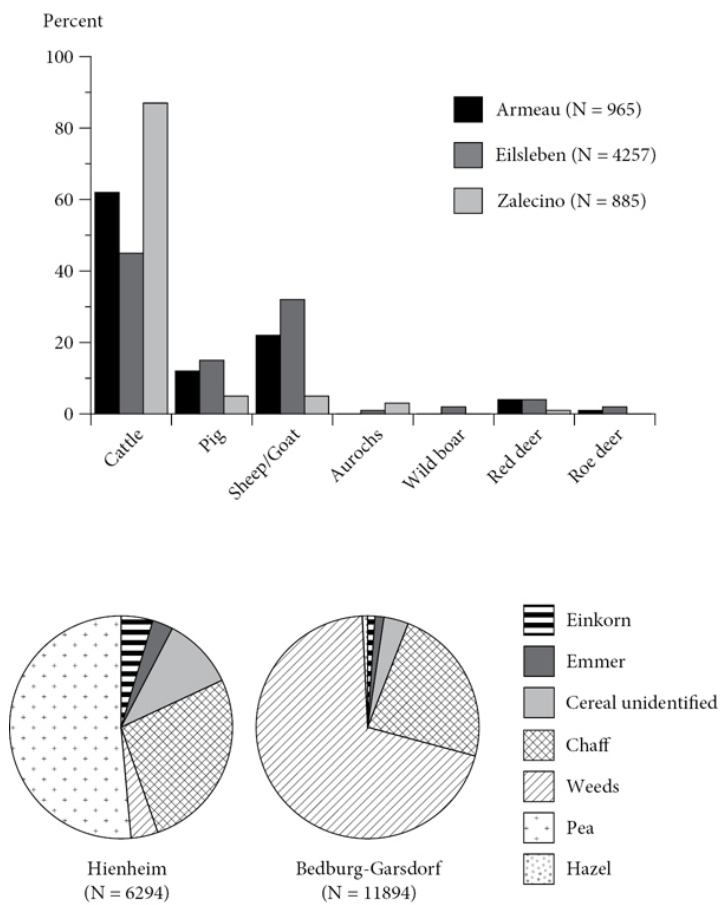


FIG. 22.3. Economic remains from a few LBK sites. (a) Histogram showing relative frequency of the main food mammals at three sites in France, Germany, and Poland. (b) Pie charts showing relative frequency of charred plant remains.

Bones: Armeau from [Poplin \(1975\)](#), Eilsleben from [Döhle \(1994\)](#), table 6), Zalecino from [Sobocinski \(1984\)](#), table 2). Plant remains: Hienheim from [Bakels \(1978\)](#), table 15), Bedburg-Garsdorf from [Knörzer \(1974\)](#), Table 1), Oldenburg-Dannau LA191 from [Kroll \(1981\)](#).

LBK farmers arrived with the full suite of domestic animals. Cattle were not independently domesticated in central Europe, and their DNA shows that the breed had its origins in modern Anatolia ([Legge 2010](#)). [Figure 22.4](#) presents distal metacarpal measurements from various populations. The Danish sample of aurochs forms the metrical benchmark. The German LBK animals are considerably smaller, and at no sites are there animals intermediate in size between aurochs and domestic cattle. Pigs are more complex. The first domestic animals in Europe carried Near-Eastern mtDNA, indicating importation from that region. Later in the LBK, morphologically domestic pigs appear that carried the mtDNA lineage of European wild boar. This suggests that farmers incorporated female wild boar into their domestic pig population ([Larson et al. 2007](#)). There is zooarchaeological evidence that this happened in the Paris Basin ([Tresset and Vigne 2007](#), [Fig. 22.2](#)).

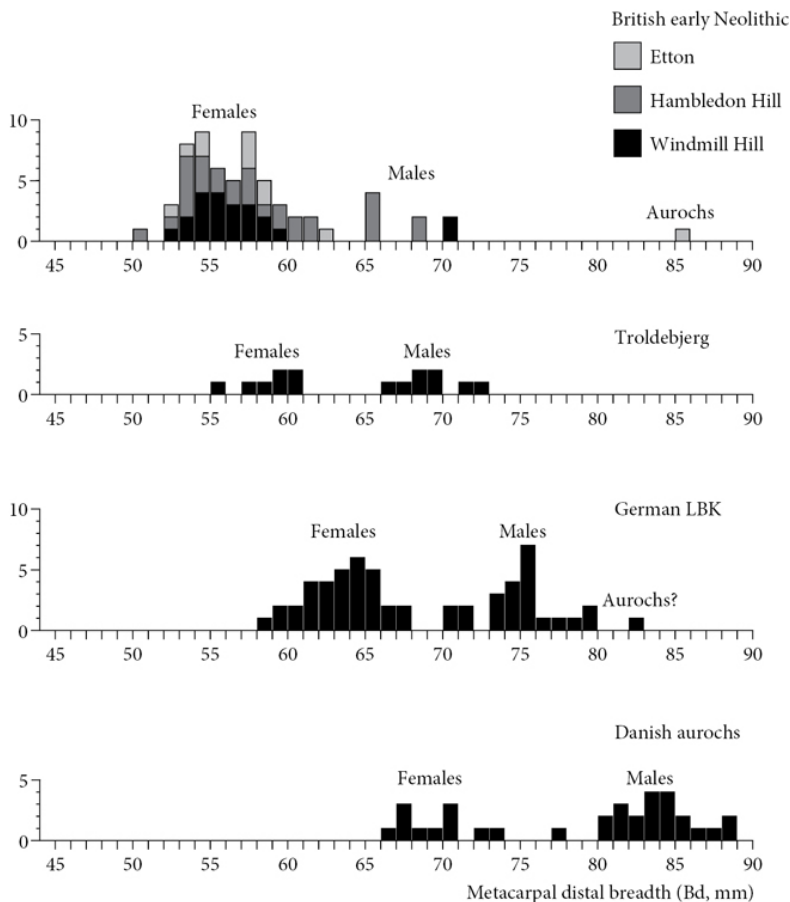


FIG. 22.4. Histograms of cattle metacarpal distal breadth, BD as defined by [von den Driesch \(1976\)](#). Danish aurochs from [Degerbøl and Fredskild \(1970, table 11\)](#), German LBK from [Müller \(1964, 154\)](#) and [Döhle \(1994, 186–187\)](#), Troldebjerg from [Higham and Message \(1968 table C\)](#), Etton from [Armour-Chelu \(1998, appendix 1\)](#), Hambledon Hill from [Legge \(2008, table 8.28\)](#), Windmill Hill from [Grigson \(1965, table VII, xv, 1999, appendix 1.1\)](#).

Cultivation was also modified to suit the temperate forest environment. The wide range of crops cultivated in the Balkan Neolithic dwindled to just five: einkorn wheat, emmer wheat, pea, lentil, and linseed ([Kreuz 2007](#)). It is remarkable that barley, now tolerant of poorer conditions than the wheat species, was not part of this crop suite. Two botanical assemblages are shown in [Fig. 22.3](#). As discussed, these fully agricultural economies are represented mainly by their waste products: chaff and weed seeds. The weed seeds are characteristic of crops grown in small intensively cultivated ‘garden’ plots rather than more extensive fields ([Bogaard 2004](#)), so cultivation was probably carried out with hoe and digging stick rather than the ard. The pig may also have been useful as a quasi-tool, preparing and

manuring land in advance of sowing ([Rowley-Conwy 1981](#)). It is not clear whether the sowing season continued to be the autumn, as in the Balkans ([Bogaard 2004](#)), or was changed to the spring ([Kreuz and Schäfer 2011](#))

The LBK thus appears as a scatter of specialist ‘loess farming units’, operating a system of agriculture that was considerably modified from that of its parent cultures in the Balkans. It is remarkable how little attention the LBK farmers paid to the resources of the forests that surrounded them: their economic efforts were focused almost entirely on farming the clearings they occupied.

NEOLITHIC FARMING NORTH OF THE LBK

Along its northern border, the LBK spread stopped as abruptly as it had begun. It had reached the northern edge of the loess to which it was adapted. Well drained and fertile morainic soils lay further north in southern Scandinavia, but the loess was separated from this by a zone of poor glacial outwash sands, which formed a zone of ‘badlands’ not well suited to agriculture.

The farming standstill lasted for some 1,500 years. Mesolithic hunter-gatherer populations were extensive well to the north—the Ertebølle of southern Scandinavia—and also closer to the farmers further west—the Swifterbant of the Rhine–Waal–Maas estuarine complex and the IJsselmeer. Fewer appear to have occupied the area between the LBK and the Ertebølle. Whether these hunter-gatherers acquired any domestic animals from the farmers has been a subject for discussion for several decades.

Some specific instances of claimed domestic animals may be mentioned. A *Bos* metacarpal from Rosenhof in northern Germany was originally claimed to be domestic ([Nobis 1975](#)), although there were grounds for believing it was from an aurochs ([Rowley-Conwy 2003](#)). Recently, molecular biological work has suggested that the animal was indeed wild: its diet was similar to aurochs ([Noe-Nygaard et al. 2005](#)), and its mtDNA lineage was of Near-Eastern and not native European origin ([Scheu et al. 2008](#)). Some other cases are claimed, including a few goat bones in the Netherlands (reviewed in [Rowley-Conwy 2013](#)). The goats are undated by radiocarbon, but if they really are Mesolithic they must have been acquired from, or have escaped from, the nearby farmers.

Farming finally spread northwards around 4000 BC. The *Trichterbecher* or *trægthæger* (TRB) extended north to the latitude of Oslo and Stockholm. Its farming regime was very different from that of the LBK ([Fig. 22.5](#)). The cultivation regime was further modified:

peas and lentils, fairly common in the LBK, disappear; einkorn diminishes nearly to vanishing point; and barley reappears and dominates at some sites. In the late Neolithic, cereal agriculture spread into south-western Norway, and the sample from Voll has mostly barley among the identified cereal grains (Fig. 22.5). In Denmark, the ard was present at Hanstedgård at the start of the middle Neolithic around 3300 BC (Eriksen and Madsen 1984), and at the late Neolithic site of Hjelle in south-western Norway at the time of the first evidence for cultivation in this region (Soltvedt 2000).

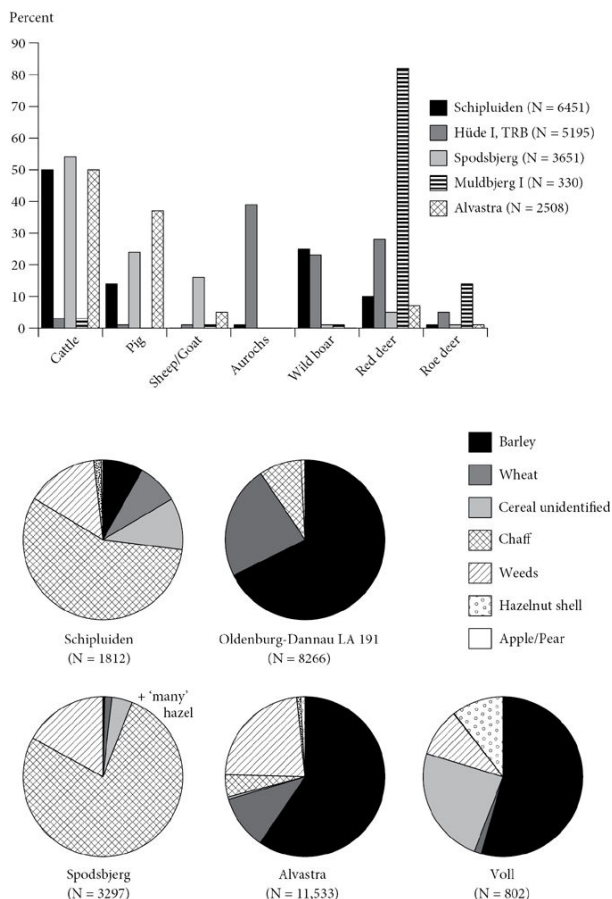


FIG. 22.5. Economic remains from selected continental Neolithic sites in the area north of the LBK. (a) Histogram showing relative frequency of the main food mammals from Schipluiden (Netherlands), Hüde I TRB level (Germany), Spodsbjerg and Muldbjerg I (Denmark), and Alvastra (Sweden). (b) Pie charts showing relative frequency of charred plant remains from Schipluiden (Netherlands), Oldenburg-Dannau LA 191 (Germany), Spodsbjerg (Denmark), Alvastra (Sweden), and Voll (Norway). Bones: Schipluiden from Zeiler (2006, table 22.2), Hüde I from Hübner et al. (1988, table 16), Spodsbjerg from Nyegaard (1985, table 1), Muldbjerg I from Noe-Nygaard (1995, table 6),

Alvastra from [During \(1986, table 6\)](#). Plant remains: Schipluiden from [Kubiak-Martens \(2006, Appendix 19.2\)](#), Oldenburg-Dannau from [Kroll \(1981\)](#), Spodsbjerg from [Robinson \(1998, table 1\)](#), Alvastra from [Göransson \(1995, tables 3, 4, and 5\)](#), Voll from [Soltvedt \(2000, table 1\)](#).

The animal economy was also different: the LBK uniformity disappeared. Some sites have a dominance of domestic animals ([Fig. 22.5](#)), and even at Skumparberget, at the northern extremity of the TRB near Stockholm, the bones comprised only domestic animals with cattle at 82% ([Bäckström 1996](#)). But at other sites wild mammals predominate. In Denmark, Muldbjerg I and others have a large proportion of wild mammals in the early Neolithic, before c. 3300 BC. Thereafter domestic species predominate everywhere. Isotopes in human bone mostly suggest a terrestrial diet, based presumably on agriculture, from the start of the Neolithic ([Richards and Koch 2001](#)). Further south, in northern Germany, wild resources continued to be significant until much later. Hühde I (TRB layer) is dominated by wild mammals ([Fig. 22.5](#)), and Parchim continues this pattern into the late Neolithic. Some of the sites in this region have remarkably high frequencies of wild horse ([Sommer et al. 2011](#)), and many also have substantial numbers of beaver and otter, birds, and fish (reviewed in [Rowley-Conwy 2013](#)). All in all the evidence for agriculture in the ‘no man’s land’ region between the northern edge of the former LBK area and the Baltic hinterland is rather weak throughout the Neolithic.

At the end of the early Neolithic around 3300 BC, agriculture went into retreat: the northern edge of farming withdrew from near Stockholm and the island of Gotland, to the southernmost part of Sweden in the middle Neolithic. So-called ‘Pitted Ware’ hunter-fishers replaced TRB farmers in much of the central Baltic. Ancient DNA suggests that Pitted Ware people may have been of a different ethnicity to the farmers ([Malmström et al. 2009](#)). On Gotland, wild boar replaced the domestic animals of earlier times ([Rowley-Conwy et al. 2012](#)). Animal bones from Pitted Ware sites are overwhelmingly from wild animals (reviewed in [Rowley-Conwy 2013](#)), and stable isotopes in human bones reveal that Pitted Ware people throughout eastern Sweden consumed a diet very high in marine foods ([Fornander et al. 2008](#)).

BRITAIN AND IRELAND

The earliest sign of any domestic species in this region (apart from the dog) is from Ferriter’s Cove in south-western Ireland. Two domestic cattle bones have been directly dated to c. 4300 BC ([Woodman et al. 1999](#)). How they arrived there is unclear ([Tresset, this volume](#)); no

continental Neolithic influence can be seen on Britain at this time, which remained firmly Mesolithic, so direct contact with possible areas of origin such as Brittany is most likely. Perhaps the bones arrived in joints of meat rather than live animals.

The Neolithic appears in Britain just before 4000 BC, in Ireland perhaps a century or two later (Whittle et al. 2011). The British Neolithic is the scene of a unique debate about the onset of farming: was the adoption gradual, with a mobile 'Mesolithic' lifestyle continuing through much of the period (e.g. Thomas 2008), or rapid, involving a considerable amount of immigration (e.g. Rowley-Conwy 2004)? Or is a middle position, stressing local variability, the best option (e.g. Cummings and Harris 2011)?

Animal bones from almost all Neolithic sites have an overwhelming predominance of domestic animals (Fig. 22.1). There is now general agreement that aurochs, wild boar, and deer are surprisingly rare (Legge 2010; Serjeantson 2011). The only exception is the isolated early Neolithic pit at Coneybury (the 'Coneybury anomaly'), which contains the remains of ten domestic cattle and seven roe deer, perhaps the remains of a single feasting event (Maltby 1990). This is the only site of this kind, and the roe deer in any case produce less than 10% of the meat weight (Rowley-Conwy 2003b, fig. 5). It would certainly not be safe to generalize from it to the whole Neolithic economy. It is true that animal bone assemblages from the first couple of centuries of the Neolithic remain elusive, and those plotted in Fig. 22.1 are from ritual monuments. Assemblages from settlements, dated to the crucial couple of centuries, will be of the greatest interest. What can be said at this stage is that by the time the early Neolithic was fully established, wild species played only a peripheral role in the economy.

Apart from some finds of linseed, cultivated plants are dominated by just two species, emmer and barley, with bread wheat appearing at a few sites; barley apparently becomes more common in the late Neolithic. The importance or otherwise of the cereals has been very contentious. We saw in the methodology section that we cannot simply sum the plant remains from any site and expect that the result will present an 'averaged' picture of the economy in the way that the animal bones do. The contrasting samples from Scord of Brouster make this clear (Fig. 22.1). Workers elsewhere in Europe all assume that cultivated cereals were overwhelmingly predominant despite the high frequency of weeds at some sites (e.g. Bedburg-Garsdorf in Fig. 22.3). Hazelnut shell is common at many British Neolithic sites. Samples containing many weeds and hazelnut shells, interpreted at face value, have been used to suggest that wild species provided most of the plant food (e.g. Thomas 2003). But nut shell, like weed seeds, is

a waste product, which may even have been used for kindling and thus commonly be charred (Jones 2000). Recognition of the complexities of plant samples suggests that cereals were predominant in most places: what we see are their waste products, discarded as useless and burnt by chance along with the nut shell (e.g. Legge 1989; Jones and Rowley-Conwy 2007).

The problems are illustrated by the samples in Fig. 22.1, all from early Neolithic timber houses. Tankardstown in Ireland is dominated by cereals, with an admixture of apple or pear; chaff and weeds are uncommon. Chaff is much more common at Lismore Fields 1, whilst at Yarnton hazelnut shell predominates. The early Neolithic plant economy was however probably fairly similar at all three: the chance exigencies of charring caution us not to accept these samples at face value. This understanding has led to a recent reappraisal of the role of cereals in the British Neolithic: even the proponents of a gradual transition and the continuation of a largely 'Mesolithic' economy into the artefactual Neolithic now restrict their arguments to the *early* Neolithic (Thomas 2008). A degree of regional variation (Cummings and Harris 2011) remains possible: Bishop et al. (2010) found that whilst agricultural plants dominated the Neolithic economy in most of Scotland, the Outer Hebrides might have persisted in a largely hunter-gatherer way of life. The importance of cereals in the early Neolithic is now generally accepted, to the extent that a cereal decline has recently been suggested for the late Neolithic (Stevens and Fuller 2012); but whether this is anything other than an artefact of research emphasis remains to be seen.

The importance of dairying has been mentioned. We lack settlement sites producing samples like that from Grime's Graves (Fig. 22.2). Most information on the Neolithic economy in England comes from sites of a ceremonial or ritual nature, such as the causewayed enclosures (Andersen, this volume). Distal metacarpal measurements from three are plotted in Fig. 22.4. The British sites, like contemporary Troldebjerg in Denmark, have smaller cattle than the German LBK sites, reflecting the fact that they are some 1,500 years younger. Unlike Troldebjerg, however, cattle ate at the British sites do not divide equally between the sexes: females predominate at all three.

Cattle at Hambledon Hill were killed mostly between two and four years of age (Legge 2008). An economy in which dairy husbandry was highly developed would have a surplus of young females at precisely this age, when the best breeding cows would be selected whilst those with less desirable traits would be culled and eaten. Further, the cattle bones at Hambledon Hill showed less breakage than is commonly found at archaeological sites, often with the limb segments discarded

with the bones still in articulation. This shows that the cattle were consumed in a more lavish manner than usual, indicative of large-scale meat consumption in the manner of feasting. The cereals too were brought partly prepared. Hence, this was a site for consumption rather than a place where such foods were raised and prepared. Thus whilst the entire cattle economy is not represented here in the way that it is at Grime's Graves, the pattern nevertheless supports the argument for a dairy economy.

CONCLUSIONS

We have traced the arrival and development of farming in the Neolithic of western and northern Europe. The spread was not steady; it stopped at the northern edge of the LBK for some 1,500 years before it then rapidly moved into southern Scandinavia, Britain, and Ireland; northern central Germany was apparently missed out of the initial advance, being infilled only later; and the spread into environmentally hostile regions such as north-western Scotland was delayed.

For the most part, however, the spread of agriculture appears to have been a rapid and complete process. Claims for domestic animals (other than the dog) in Mesolithic contexts have almost all proved spurious—Ferriter's Cove in Ireland is an outstanding exception to this. The 'Mesolithic' economic component in most Neolithic economies is currently being downplayed. Consequently most transition events look much sharper than they did just a few years ago (Rowley-Conwy 2011).

A gradual transition implies local continuity, and thus a considerable local component in the human population that became farmers—though some immigrants are never excluded. A rapid transition need not imply local community, but could be brought about by immigrant farmers—though of course some local involvement is never excluded either. This debate continues. As the study of prehistoric genetics becomes more routine, more light will be cast on this issue. But for the time being the pendulum has swung towards a greater immigrant component. Whether this will stand the test of time will be a matter of great future interest.

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CHAPTER 23

THE NEOLITHIC YEAR

DIMITRIJ MLEKUŽ

INTRODUCTION

HUMAN activity is not only embedded in the long-term unfolding of history, but also in more repetitive daily and seasonal cycles. The impressive achievements of environmental archaeology—in developing tools and approaches for determining the seasonality of a site (from the presence or absence of certain organic finds to physical indices on the bones and teeth of animal remains, or, more recently, stable isotope analysis)—have assisted in interpreting sequences of events throughout the year (e.g. [Blaise and Balasse 2011](#); [Pike-Tay et al. 2004](#); [Valamoti 2007](#)). Whilst these approaches identify discrete blocks of time, and their associated seasons and tasks, they have yet to consider the wider implications of these sequences of activity for long-term change.

As a result, seasonality serves only as an ecological backdrop to pre-industrial communities which are presented as timeless, locked in an ever-returning agrarian year and living outside of history. But how do the repetitive tasks of the yearly cycle relate to each other? How do they structure relations between people, other social agents, and the material world: and how does history emerge from those relations? This paper is concerned with the way in which the rhythmic temporality of the yearly course was woven into the way European Neolithic people lived, experienced, and transformed their worlds. It examines how routine social practices structured within the yearly cycle extended their duration to the life-courses of people and objects, and to generational and longer-term changes. Its main point of departure is the concept of ‘being in the world’, or the dwelling perspective ([Heidegger 1962](#); [Ingold 2000](#)), where human experience consists of relationships with other people, other social agents, and the material world, and is performed through tasks and activities which change the material world and thereby extend their effects beyond their immediate execution.

MUSIC OF SOCIAL LIFE

Life consists of a continuous flow of daily tasks. People's time is consumed by these, no matter how insignificant or trivial they might seem. Walking, cooking, caring for children and animals, attending plants, hunting, building, and talking are all part of this flow, and are activities which perpetuate life and create histories. We are born into this flow and begin to participate in it from the beginning of our lives. But those tasks are not isolated, discrete events, like beads on a string; they are more akin to music. In music, we do not hear isolated tones, but rather tune, as [Husserl \(1964\)](#) illustrated in his highly influential work on the phenomenology of time consciousness, and tune is created by repeatedly remembering past tones (retention) and anticipating the next (protention). Analogously, every task 'has its own thickness and temporal spread' ([Gell 1992](#), 223). They make sense only when related to those already performed and those to be performed. Hence, life is not just a succession of isolated seasonal tasks, but a flow of tasks implicitly or explicitly related to one another. Each task is made possible by past tasks—and future tasks give it purpose. This network or 'referential system' ([Gosden 1994](#)) unfolds over space and time.

Tasks have their own specific temporalities which emerge from the interaction between people and the material world around them. The temporality of tasks is inherently social, the result of attending, adjusting, and timing our acts in relation to other agents and rhythms of the material world. [Tim Ingold \(1993, 2000, 196–197\)](#) calls this process 'resonance'. Just as music emerges from the interactive attention of musicians to each other and their instruments, social life emerges from the mutually attentive performance of social agents and the world around them. But this resonance is not only with other humans. By performing tasks we are alert to the conditions and changes in the environment, such as weather or the ebb and flow of rivers, adjusting actions accordingly. We attend animals, are aware of their own tasks or bodily rhythms, and we also resonate with plants and their growth cycle. Similarly, plants and animals respond to the actions of people and their rhythms, creating a sociality which transcends the species boundaries. Environmental rhythms imposed from the outside therefore become woven into the tune of social life.

[Mark Harris \(1998\)](#) describes the rhythms of sociality in the Amazon floodplain. During the flood season people are confined to their houses: this is a time of low moods, illness, and potential danger. But when the water recedes, a burst of social activity and cooperation emerges: people are in a good mood, and this is a time of feasts but also tensions and conflicts. The rhythmic temporality of social life

reflects the seasonality of the Amazon and emerges from people's active engagement with its ebb and flow and with each other.

Rhythm is what makes music move on and flow. The same can be said for the flow of life. It is the repetition of tasks that creates time, and gives pace or tempo to social life. And through the rhythmical repetition of tasks they become learnt and embodied as practical skills and postures. Through this pattern of involvement with surroundings and specific routines, people acquire 'dispositions', or a 'logic of practice', about how to go on (Bourdieu 1977). This entire subjective experience of the world, or *habitus*, does not need discursive formalization since it results from participation in the flow of life.

As with music, there is interplay between performance and more durable *habitus* (Harding 2005). The material world has a crucial role in this. Tasks are material practices which involve bodies, things, and places. People till gardens with tools, harvest crops with sickles, store grain in the house, dump refuse on the midden, prepare food in a container, share and eat it, and excrete and dump substances. Bodies, things, and places are mutually constituted through action (Knappett 2005; Latour 2005; Miller 1987), becoming changed during their joint performance of tasks. Tasks leave traces on tools, places, and bodies. Through repetition those traces accrete or layer one upon another, and through this process repair, adaption, modification, or curation occur, creating sedimented biographies of objects, bodies, and places (Gosden and Marshall 1999; Knappett 2006). People also become more skilled as tasks are repeatedly performed. Their bodies accumulate skills, repertoires of stances and gestures, and knowledges alongside the traces of past practices. Rhythms of daily and yearly engagement are thus 'techniques of the self' (Foucault 1988; Warnier 2001) through which people are constituted.

This mutuality is a continuous historical process, a rhythmical flow through which people, things, and landscape can constantly change. Due to the inherently material nature of tasks, cyclical repetitions and flow repeatedly constitute each other—and by constantly involving and changing bodies, objects, and substances, the material world is forever in the process of 'becoming'. As Chris Gosden (1994, 77) puts it, the 'world created by people will be a world into which their children will be socialized'. Hence, every repetition has the potential for change and renewal. The flow of life is carried on by repeating seasonal tasks, but because people, things, and places change, no one season is the same.

The non-discursive nature of most practices does not mean they are incapable of creating meaning. Routines may be embodied, but they are seldom neutral. The *habitus* has an endless generative capacity for producing ideas, perceptions, emotions, or actions. The material world

has a crucial role in this. The famous Kabyle house, for example, is a principal locus for the objectification of *habitus* which gives meaning and significance to daily and seasonal tasks by providing analogies between the agrarian cycle, its spatial division, and the arrangements of material culture within it. The Kabyle house brings together space and the material world with the rhythms of daily life and the agrarian calendar (Bourdieu 1990). Meaning is generated at the intersection of the material world and the temporalities of social life.

THE TEMPORALITY OF NEOLITHIC HOUSES AND GARDENS

In the seventh millennium BC, people in Greece and the Balkans created new social settings by selecting particular places in the landscape and erecting durable structures. Those places were centres of activity, and they structured the way people interacted with each other, with animals, and with the surrounding landscape (Bailey 2000; Borić 2008). They were where the bulk of activities, daily rounds, seasonal tasks, and people's life-cycles took place. Houses and settlements were literally places where time and space intersect and fuse, giving meaning to the flow of social life.

But there are also marked differences in the way people organized and reproduced their social settings. In some villages, especially in Greece and Bulgaria, houses were closely spaced; people and animals lived together in a cramped social environment. People emphasized the sense of bounded space by digging ditches or erecting palisades around settlements (Fig. 23.1). Houses were not relocated, but re-used the same plots. Cycles of destruction, reworking, and building over generations created large artificial tells.

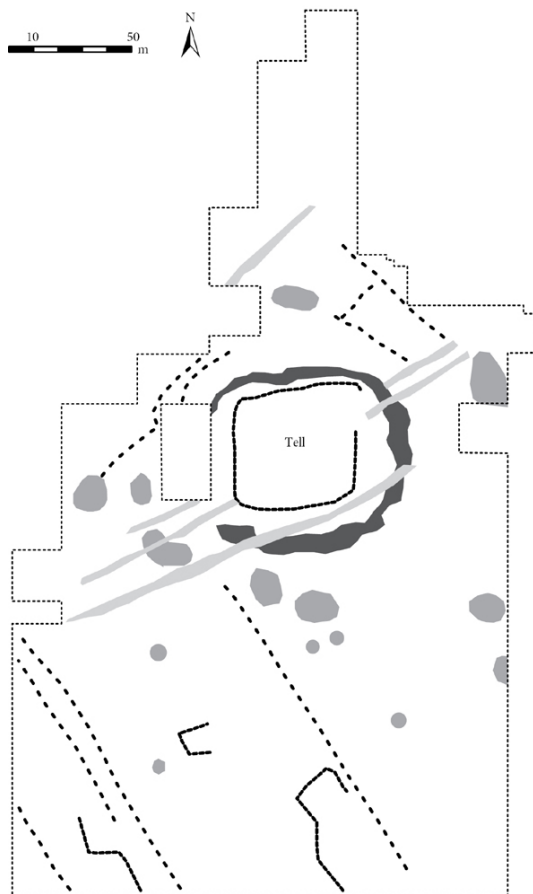


FIG. 23.1. The Eneolithic tell of Podgoritsa (Bulgaria) with offsite structures. Ditches, other linear features (field boundaries or water management structures), and anomalies which might represent rubbish tips or off-site structures can be seen around the tell. Gardens were located outside it (after Bailey et al. 1998, fig. 4).

In the northern Balkans, but also in Greece, we have evidence of short-lived settlements, consisting of widely spaced wattle-and-daub houses (Fig. 23.2). Many houses were (intentionally) burnt down, creating deposits of daub which were moved around or incorporated into pits and other features. New houses were rebuilt elsewhere and settlements abandoned after a few generations. There is a general ‘sense of ephemerality’ (Thissen 2005), marked not only by destruction and the displacement of houses, but also by traces of people and animals leaving and coming to the site (Valamoti 2007; Whittle 2007). Obviously, other activities were integrated into the flow of social life, but occurred elsewhere: examples include herding, fishing, hunting, and gathering.

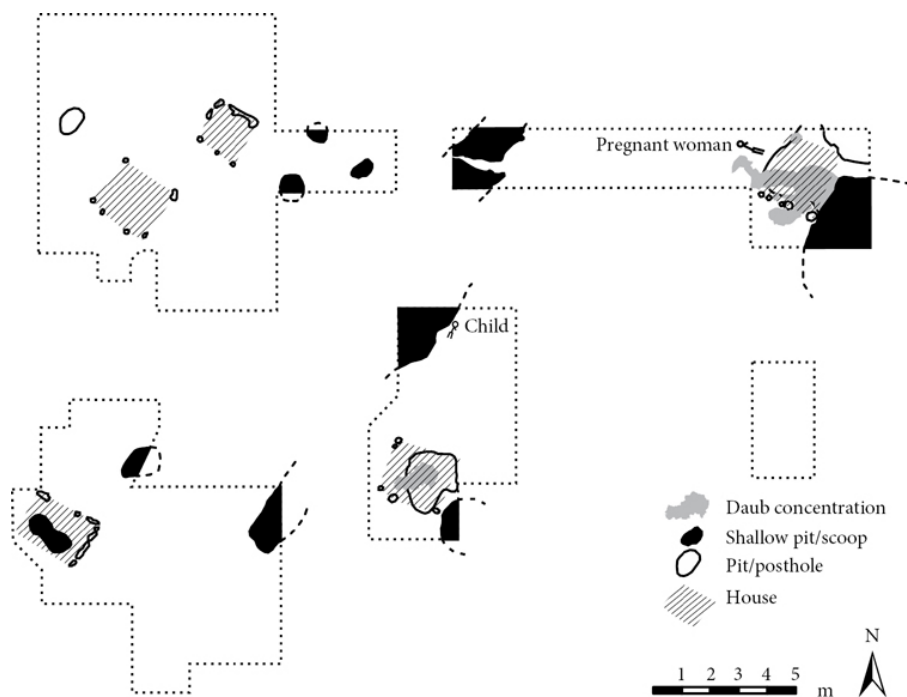


FIG. 23.2. The Starčevo phase at Divostin (Serbia). Houses are separated by open areas and surrounded with large irregular shallow pits, filled with daub, ash, and bone. The areas between them were probably used for gardens, animal pens, paths, rubbish pits, tips, and other activities. A pregnant woman and child were deposited in the shallow pits (after [Bogdanović 1988](#), plan I, fig. 5.7).

But villages, with their new social setting and intrinsic temporality, were not the only innovations. There were also new tasks, based on novel associations with people, material culture, plants, animals, and landscape. Those associations were not the same everywhere, part of a totalizing and unifying ‘package’, but were constituted from a repertoire or interrelated set of ‘new’ and ‘old’ material resources available to people ([Thomas 1999, 2003](#)).

The relative importance of specific cereals such as emmer, einkorn, and barley; legumes such as bitter vetch, grass pea, and chick pea ([Kreuz et al. 2005](#); [Marinova 2007](#); [Valamoti and Kotsakis 2007](#)); and animals such as goats, sheep, cattle, and pigs ([Halstead 1996](#)) differ from site to site, but collectively embody new social relations. It seems that ‘growing crops and raising animals are not just ways of producing food; they are forms of life’ ([Ingold 1996, 24](#)).

There is a lack of evidence for large-scale clearance in the European Neolithic. Data from weed composition suggest that intensive garden cultivation was the most common form of crop production in Neolithic Europe ([Bogaard 2004a, 2004b, 2005](#)). Gardens require a constant human presence, with monitoring, tilling, protection, manual

weeding, and manuring. It takes years of care to produce good fertile tilth (Jones 2005). There was also a strong rhythmic flow of substances and animals, including the transportation of manure and midden deposits to the garden plots; taking grain, chaff, and straw back from the gardens; and the grazing of fallow and young cereals to prevent lodging (Halstead 1996, 2006). In short, there was a very close relationship between people and their gardens. This implies the spatial proximity of garden plots to the settlements and houses (Jones 2005). Given that they provided grain for households (Bogaard 2004b; Halstead 2000; Jones 2005), these plots were most likely permanent, if not extensive.

On extended settlements the gardens might be located within the settlement between the widely spaced houses (Kotsakis 1999, 73) (Fig. 23.2). Large shallow features and pits filled with domestic debris, including burnt cereal processing waste rich in phytoliths, burnt bone, fish remains, coprolites, and the burnt remains of stock herding (animal fodder, bedding, dung), might be the remains of middens which were spread on the gardens (e.g. at Ecsegfalva: Macphail 2007; Whittle and Zalai-Gaál 2007). On the nucleated tells the gardens were located outside the settlement (Fig. 23.1). The physical separation of domestic and agricultural space on nucleated settlements, sometimes emphasized by ditches and palisades (Bailey et al. 1999, 153–154), was a means of creating household identity, together with the control of space within the domestic areas themselves. On the other hand, the close association of gardens and houses on dispersed settlements may have played an active part in the negotiation of social identity within households (Johnston 2005; Kotsakis 1999).

Environmental evidence provides an outline of seasonal tasks in the gardens: gardens were sown in autumn (Bogaard 2004b; Bogaard et al. 2007; Marinova 2007); spring was a time of grazing young cereals, then weeding, and as their crop was becoming ripe the plots would need protection; intense summer activity culminated in harvesting in July or August, followed by the processing and storage of crops, the grazing of fallow, tilling and manuring, and then finally sowing again in September or October.

Yet gardens were not only places of production, but locales where people, animals, and plants interact with each other, where environmental knowledge and skills were learned and controlled, and where social roles and identities were defined, maintained, and contested (Johnston 2005, 212). Garden plots were places where the rhythmic temporalities of plant growth, the daily and annual rhythms of people's tasks, and animals visibly came together. Through activities and the flow of substances, people and garden plots mutually established each other.

Annual plants, such as cereals with their fast lifecycles, participated in the social world of interpersonal relations as people observed their growth (Hastorf 1998; Rival 1993). Different seasonal tasks gave rise to different possibilities in social lives as they provided fixed places and a diversity of meaning (Evans 2003, 233–234). Activities connected with caring for plants evoked connotations which associated gardens, plants, and other activities with qualities linked to parenting (Brück 2005, 150–151). In this sense, working the garden, caring ‘with almost individual attention to crop plants’ (Bogaard 2004b, 41), and ‘establishing the conditions for growth’ (Ingold 2000, 86) can be related to the care of children (Hastorf 1998).

Garden work would have been implicitly or explicitly connected with other tasks in the flow of social life: people associated with them have their patterns of rhythmic movement associated with other people, animals, and other places, these then becoming part of their identities. The flow of substances, people, and animals link gardens with other places and thus establish material and conceptual connections between places and activities—hence, the agrarian cycle becomes grounded in different temporalities as mnemonic and anticipatory relations are played out as specific social practices.

In this way activities performed on gardens extended beyond their duration. Gardens acquired a ‘temporal thickness’ through being the medium for those activities and through the accumulation of residues from the activities themselves. Like Keith Basso’s (1996, 62) description of Apache places, they were locations ‘where time and space have fused and where, through agency of historical tales, their intersection is “made visible for human contemplation”’. Different temporalities became interwoven into biographies through the garden’s daily maintenance, the annual growth of plants, and the agency of ancestors who created and maintained the plot in the past. Therefore, the Neolithic year was only one of the scales of time generated and experienced in each unfolding Neolithic garden.

The growth of the garden

The biography of a particular clearing started with the choice of place for the settlement and the act of clearing the forest and erecting huts. The clearing, houses, and garden plots thus provide material evidence which links the ancestors, who created the particular setting, with the people now living there and maintaining the continuity of seasonal and daily routines. People clearing space for the houses and gardens were socialized in such places themselves, acquiring their skill and knowledge of how to treat people, crops, animals, and substances.

Gardens with their accumulated histories are media through which

the agency of ancestors could be felt, but the growth and care of annual plants also testifies to the skill, effort, and knowledge of people maintaining them ([Malinowski 1965](#)). Rhythmical flows of activities performed within gardens produce and reproduce historical knowledge and moral wisdom (cf. [Basso 1996](#)). The gardens exercise their own agency in the process, as they not only provide the context for the growth of plants, but through their material presence and continuous transformation during the agrarian cycle remind people of the past and serve to shape future conducts.

Gardens were worked, manipulated, changed, and curated. They need constant daily maintenance and a flow of substances to replenish the nutrients in the soil. Through middening the discard from houses is incorporated in the matrix of the garden, making the soil more organic, fertile, and darker in colour ([Jones 2005](#)). Hence, houses fed gardens which in turn fed those houses. This accumulation of substances and residues also incorporates the identity of people in the soil of the garden plot as traces then encountered during daily work. Tilling, for example, exposes the buried pottery or bones from the midden, making visible the work of the ancestors (cf. [Evans 2003](#), 45–72). In this way, the garden is never complete and finished (cf. [Borić 2002b](#), 50). Neither would its existence be taken for granted. Left alone for a few months, or even a few weeks, gardens become overgrown with weeds, hiding indices of human agency.

Gardens and houses

The agrarian year can be divided into a ‘production period’ where the conditions for growth are established by low-intensity activity like weeding and the protection of plants, and shorter but more labour-intensive ‘working periods’ which include tilling, sowing, and harvesting ([Marx 1967](#), ch. 12). Grain becomes available only after harvest and the temporality of ‘delayed return’ ([Woodburn 1980](#)) means it must be stored for future use, becoming quite literally part of the house. It is incorporated into storage bins, vessels on the floor, bags, baskets hanging from the ceiling, or is stored as sheaves in the roof rafters ([Marinova 2007](#)) and in storage pits around the houses. Stored, the seeds are dormant, waiting to be consumed or brought back to the gardens.

Controlling the flow of materials from gardens to storage is an important means of maintaining the identity and coherence of the ‘house’ (*sensu* [Borić 2008](#)). [Julia Hendon \(2000, 50\)](#) says: ‘Storage, whether “utilitarian” or “ritual”, raises issues of secrecy, memory, prestige, and knowledge that help construct the moral system within which people live’. Control is the embodiment of the ties and claims of

houses over gardens. In this way, stored grain not only embodies labour throughout the agrarian year but also the agency of ancestors.

Houses possess a different sociality to gardens. They are the focus for the accumulation, preparation, and distribution of food, and as such are places of mutual obligation between the members of a house, and indeed the whole community involved in the production process. Thus the house is not necessarily opposed to the community, but rather an embodiment of the different relations expressed at different times in the yearly cycle (Harris 1998, 78). The transfer and storage of grain in houses is a time when different relations between people become explicit and when identities are contested and negotiated. If the 'production period' is a time of shared work across the open space of gardens, then after harvest tasks become confined to the houses. Thus the seasonal rhythm of agrarian tasks associated with tending annual plants also embodies contradictory social relations of production, one based on conviviality and collective production, the other on the appropriation of crops and accumulation by houses.

There were obviously different ways that houses were connected with gardens through the flow of substances and people. Soultana Valamoti (2005) noticed that in northern Greece nucleated sites appear to be rich in grain, cereals, and pulses whilst extended sites are rich in chaff. This is a result of different flows of substances, and different ways plants were being used and deposited. On nucleated settlements, storage of grain in the houses and (intentional?) destruction of houses resulted in deposits of burnt grain. On the extended settlements burnt chaff ended up in the pits, hearths, ditches, and floors. Whilst burnt grain is an index of storage, chaff is a result of dehushing, a time-consuming process which was part of the preparation and consumption of grain. Thus, on nucleated sites, with the clear demarcation of space between the settlement and the surrounding landscape, and between the houses themselves, the flow of substances between house and garden was tightly controlled. The lack of chaff means it was disposed of outside the settlement in gardens or refuse areas.

Domestic waste is not necessarily neutral refuse (Douny 2007). The flow of refuse from house to garden may be part of an 'economy of vitality', establishing conceptual relations between both and playing an active role in their renewal. On extended settlements, where houses were located amidst the gardens, refuse was routinely spread on the gardens, blurring the border between garden and house (Valamoti 2005). Remains of deliberately burnt houses—daub—were also incorporated in storage pits or spread around the house and possibly on the gardens (Bogaard et al. 2007; Macphail 2007). In this way, different temporalities were physically woven together. The rhythmic

temporalities of house histories and the life-cycles of their inhabitants became connected with the growth of annual plants. Burnt daub was 'stored' in the storage pits, dormant in anticipation of new growth, or 'sown' in gardens.

The bodies of children were also deposited in storage pits—a practice common in Starčevo and Körös villages—and the bodies of women deposited in the shallow pits and scoops around houses (Leković 1985), possibly in the garden themselves. Thus, for example in Divostin, a pregnant female was found buried along the edge of a daub concentration and a child deposited near a shallow pit filled with chaff (Fig. 23.2). The fact that bodies were not disturbed means they were deposited at the end of occupational cycles (Bogdanović 1988). Bodies were therefore 'sown' in the gardens or 'stored' in the pits in the same way as daub from burnt houses and seeds from gardens. This is almost a literal citation (cf. Borić 2002a; Fowler 2001) of the activities of the agrarian cycle which evokes the agency of the gardens to provide a caring environment for new growth.

Thus the rhythmical temporality of plant growth as embodied in grain is linked with the temporality of human life-cycles. Grain provides the 'conditions for growth' of humans in the same way as humans provide the 'conditions for growth' of plants. In this way the boundaries between temporalities become blurred as the garden 'fuses the cradle and the grave (the same little corner, the same earth), and brings together as well childhood and old age (the same grove, stream, the same lime trees, the same house), the life of the various generations who had also lived in that same place, under the same conditions, and who had seen the same things' (Bakhtin 1981, 210).

The metonymic connections between houses and gardens would be strengthened by using the chaff, chopped straw, or even wheat grains as temper for daub or mudbricks and possibly straw for roof thatch, as commonly practised by Neolithic house builders in the Balkans and Greece. Through the incorporation of substances imbued with the vitality of the garden, houses might have acquired their powers. Quantities of plant material incorporated into houses were considerable (Stevanović 1997, 358–359). The construction of houses was embedded in the agricultural year. It took place after harvest, when chaff and straw were available in large quantities; but this was also a potentially dangerous time, given that the intensive inter-house cooperation of the growing season was giving way to the appropriation of crops by individual houses.

Peter Gose (1991) describes a house re-thatching ritual in the Andes which creates more than just a new roof. It is a festive and even carnivalesque (*sensu* Bakhtin 1984) ritual, occurring during the seasonal shift from the individual appropriation of the dry season to

the collective inter-house production of the growing season, which plays out both opposing moralities. Their intersection and struggle animates the symbolism of the act and provides its practical grounding.

The carnival's recurrence during a significant transformation in the agrarian cycle is connected to this being a time of potential crisis or a breaking point (Bakhtin 1984). The carnival, with its emphasis on 'the material bodily lower stratum' (Bailey 2005; Bakhtin 1984)—the ambiguity of identities, the openness of the body, and the fluidity of its borders with the world, including its potential of absorbing, ejecting, and transforming substances, often in a grotesque way (excessive eating, sex, excretion)—represents the transformation of substances through bodies and objects. Death, birth, revival, and change lead to carnivalesque perceptions of the world which depend on an ecstatic collectivity that supersedes individuality, demystifies social roles and relations of power, and generates social growth and flexibility through speeches, songs, dances, feasts, and profanities. With these factors in mind, it is worth noting that large-scale feasts may have been a recurrent event during the Neolithic of at least Greece (Halstead 2004), if not also elsewhere. Thus, for example, in Makriyalos a massive deposit of animal remains was found that probably represents large-scale feasting on domestic animals that took place in autumn (Pappa et al. 2004).

CONCLUSION

Gardens are places where rhythmic temporality is clearly visible and palpable. By tending the garden during the year, people not only observe the process of growth, but actively participate in it. The generative and regenerative powers of gardens are maintained through work and the accumulation of substances which originate from the house, the midden, and animal pens. This flow of substances not only linked houses, gardens, animals, and people in a web of relations, but also created the history of the particular plot. Through the agency of gardens, the substances of humans, plants, animals, and ancestors became intertwined and fed into each other. Gardens became imbued with the vital essence of people, houses, and animals, and substances that originated from the gardens were inalienable to the process of social renewal (cf. Fowler 2004, 108). Gardens thus formed a complex amalgam of temporalities and relations created through the rhythmical flow of substance. Here, temporalities are materialized through the agency of the gardens. They provide 'material metaphors' (Brück 2004) which are used to produce

analogical relations between different tasks and temporalities. Gardens are chronotopes (Bakhtin 1981), nexuses where time is brought together and where representation can emerge. Abstract aspects of social life—cosmological and social generalizations, ideas and symbols—take on flesh and blood here, permitting the imaging power of metaphors to do their work. By bringing objects to places during the rhythmical pattern of activities, the chronotope mediates the transfer of meanings and creates temporal relationships. In this way the flows of tasks and mutuality become vehicles for collective representations about past, personal or group identity, and cosmology.

But the rhythm of seasonal tasks associated with tending annual plants has a breaking point—the harvest—which marks a shift in the flow of activities and substances, and correspondingly, in social relations. Harvest is the time of abundance, of feasts, but it also marks the shift of activities and flows of substances from garden to house, with a corresponding negotiation of social relations and identities. This transition may be associated with the special time of the carnival, where ambiguities embodied in the agricultural year become exposed, celebrated, mocked, and subverted. Carnival implies a change from stability to new possibilities. It is a time ‘out of time’ when substances acquire new forms and where carnivalesque forces of laughter and parody provide the potential for renewal, new growth, and change. Yet structure and tradition always dominate this creativity, for the carnivalesque feast also retains, reinvents, and restores the past (cf. Borić 2002b, 59–60). New and old are fused together as the cycle of seasonal tasks starts, even if people, gardens, and houses are not the same as they were last year.

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CHAPTER 24

RELIGIOUS ROUTINE AND PILGRIMAGE IN THE BRITISH ISLES

ROY LOVEDAY

RELIGION, which probably permeated all aspects of Neolithic life, presents a challenge to archaeology since the particularities of myth are intangible and the signals of iconography largely impenetrable. However, the material residues of ritual (formalized, repetitive, symbolic action) can be recovered and analysed, as [Richards and Thomas \(1984\)](#) demonstrated at Durrington Walls. From this seminal work an archaeology of religion has arisen. Ritual, which had become a term of derision associated with superficial analysis, now dominates the discourse and structured deposits appear ubiquitous. Caution is needed, though. Patterned disposal might equally reflect sequential activities or notions of purity/impurity integral to gender relations. It may be unwise therefore to apply too readily a concept devised to explain deposit formation at a highly specialized Wessex henge enclosure in wholly different social and temporal contexts ([Garrow 2007](#)). Equally, we must accept that most religious routines, however nested into cultural norms, will have remained wholly intangible (e.g. sowing, harvesting, and hearthside rites). Therefore, to adequately contextualize the limited evidence we have for religious process and development in the Neolithic, the following discussion will be temporally structured and will centre upon Great Britain, an area noted for the progressive elaboration of ritual (i.e. demonstrably non-functional) architecture.

EARLY NEOLITHIC BRITAIN (4000–C. 3500 BC)—AN AGE OF ANCESTORS

Tombs are, and undoubtedly were, the most dramatically visible evidence of people in the early Neolithic landscape (cf. [Cummings et al.](#), this volume). The collective burial of partial, disarticulated remains, when coupled with the common presence of human skeletal

material in other contexts, is a clear indicator of belief in a pervasive ancestral presence (cf. [Fowler and Scarre](#), this volume). Yet as the number of individuals represented in burials beneath long mounds varied considerably and recent dating programmes point to short, almost simultaneous deposition ([Whittle and Bayliss 2007](#)), it appears that long-held notions of lineage ossuaries are unfounded. Rather, a token ancestral presence may have sufficed to dedicate a mound, itself the critical element symbolically recording lineage identity through reference to much earlier continental long houses ([Hodder 1984](#)). The accompanying ideology remains intangible but undoubtedly far exceeded simplistic notions of ‘ancestor worship’ that arise from a western reading of ethnographic practices ([Carmichael et al. 1994](#)). Rather, in common with virtually all recorded indigenous religions, it is probable that a stratified world of the ‘others’ was envisaged with remote creator deities, more immediate elemental ones (e.g. storm, rain, wind), ubiquitous spirits in daily contact with humans, and the ancestors as intermediaries.

A window into this numinous world is afforded by cattle bones, particularly crania, found in significant locations and combinations within many Wessex longbarrows and causewayed enclosures (e.g. three ox skulls along the axial line of the Beckhampton Road long barrow, Wiltshire). The motive for placement was almost certainly religious, akin to North American plains Indians’ deployment of bison skulls. Orientation of Wessex longbarrows almost wholly within the range of the lunar maximum rising arc ([Burl 1987](#), 27–28) suggest a further element of belief, but, in view of a widespread, more generalized easterly trend ([Hodder 1984](#); [Smyth 2006](#)), could simply reflect ideas associated with the morning sky. In Scotland, northern England, and Ireland a regionally distinct and demanding rite is indicated by the deliberate burning of houses, post enclosures, and longbarrow architectural components, presumably at the close of ritual cycles ([Noble 2006](#), 45–70).

Virtually no emphatic placed deposits have been found in early Neolithic houses in the British Isles that might add a domestic element to religious practice, and this is also true of pit groups of this period ([Garrow 2007](#)). An axe placed blade-up in the foundation trench of house 4 at Corbally, Co. Kildare, Ireland, is an isolated example amongst the many Neolithic houses recently excavated there ([Smyth 2006](#)); material in other house trenches may equally be trapped discard, although cremated human and animal bone in the packing of a post hole in the house at Yarnton, Oxfordshire, appears deliberate ([Hey et al. 2003](#), 81–82). Artefacts that could reasonably be considered to have fertility connotations—carved balls, ‘phalli’, and cups—are absent from house sites. A number come from the

causewayed enclosure of Windmill Hill, Wiltshire, but mostly from later levels. Nevertheless, the carved wooden hermaphroditic ‘god dolly’ deposited at the point where the wooden Sweet Track at Westhay, Somerset, was subsiding beneath water confirms a contemporary fertility element to beliefs, and indicates the potential of the lost organic component (Coles and Coles 1986; see also Fowler and Scarre, this volume, who regard it as late Neolithic). The adjacent presence of a fine jadeite axe recalls the great number of axes apparently deposited in rivers (Bradley 1990).

MIDDLE NEOLITHIC BRITAIN (C. 3500–2800 BC)—AN AGE OF NEW GENEALOGIES

Monument complexes, as against scattered longbarrows and causewayed enclosures, make their first appearance in the middle Neolithic. Exceptionally long parallel-sided enclosures that reference house plans—cursuses—were laid out and followed by small circular hengiform sites. During the late Neolithic, henge monuments of substantial size were often added and followed in the early Bronze Age by round barrows that cluster, or were aligned, alongside the earlier linear monument. In addition to the very considerable enduring sanctity that this records (from c. 3500–2000 BC), other features set these centres apart. Late Neolithic cremation burials can reach unprecedented numbers, the monuments often differ from local sites but find distant parallels, and construction is not limited to the immediate locality but extends over a significant swathe of surrounding countryside. The extensively investigated complex at Dorchester upon Thames, Oxfordshire, exemplifies the pattern (Whittle et al. 1992; Loveday 1999), with 156 cremations coming from seven small hengiform sites (the highest number from a single location in Britain), a cursus that finds its closest parallels 120km away at Maxey in Cambridgeshire (Fig. 24.1), and a henge only comparable with others 300km to the north in Yorkshire. In addition, the complex is surrounded by a landscape of smaller cursuses set some 5–7km distant. Extensive regional fieldwork and aerial reconnaissance make it clear that this is a real pattern and not simply a product of focused excavation.

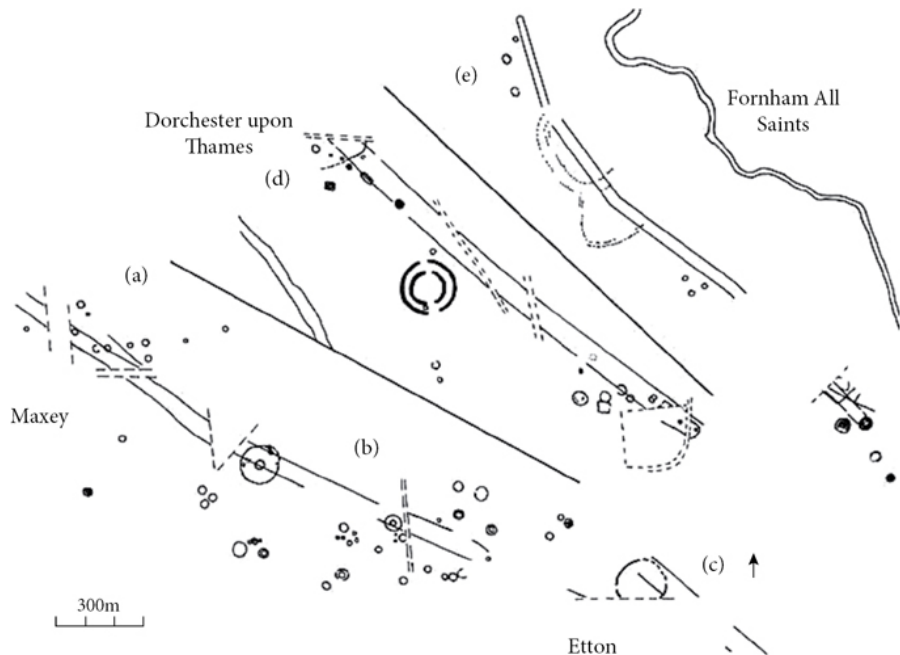


FIG. 24.1. The Maxey-Etton (a,b,c), Dorchester upon Thames (d), and Fornham All Saints (e) complexes.

In the absence of adjacent settlement evidence, the features that set Dorchester upon Thames and sites like it apart would, if encountered in an historical context, be held to signal a cult site of supra-local significance—a pilgrimage centre. These we know were often situated in a sacred landscape (18 by 12km around Varanasi; 30 by 9km around Mecca), attracted smaller shrines/offering sites (Mecca; Delphi), retained their sanctity during periods of religious change (a new sun temple built alongside the ancient shrine at Patchacamarca; mosques at Varanasi and Jerusalem), and influenced monument design across great distances (the basilica at Compostela in north-west Spain was replicated on each of the pilgrimage roads leading to it through France in complete distinction from local architecture (Conant 1959)). But can we safely extrapolate the material outcomes of pilgrimage, however generalized, from these historic early state contexts to prehistory?

The term pilgrimage simply describes out of the ordinary journeying to a sacred locale (natural or built), but through the overlay of contemporary and well recorded historical practices (by definition in complex societies) it now carries connotations of considerable, even extreme, distance, and motives of individual enlightenment or healing. Implicit are assumptions of open access and individual spirituality that probably had little relevance to earlier manifestations, not least

because of the dangers of passing through potentially hostile territory (cf. [Schulting and Wysocki 2005](#)). It is vital, then, to consider what could have constituted pilgrimage in those contexts.

Early pilgrimage

Sources pertaining to pre-Christian Europe offer insights into early pilgrimage activity. Tacitus, for example, in the *Germania* noted that:

the Semnones'... antiquity is confirmed by a religious observance. At a set time, deputations from all the tribes of the same stock gather in a grove hallowed by the auguries of their ancestors and immemorial awe... The grove is the centre of their whole religion. It is regarded as the cradle of their race and the dwelling place of the supreme god.

This ancient site defined an entire people who travelled from the limits of their *own* territory to attend the sacred assembly held there. That was equally true of pagan Irish, Scandinavian, and west Slav events, and others worldwide. Each combined seasonal sacrifice with assemblies and feasting, vital to the development of ethnos and fulfilment of the near universal dictate to 'marry out' (e.g. the Konds of southern Orissa, India, whose Meria sacrifice accompanied by a strict truce between frequently warring villages formed the sole basis of corporate, as against purely lineage, identity ([Boal 1982](#))). Importantly, this presents a consistent picture of pilgrimage as calendrical and collective rather than open and individual. It is in this form we should expect to encounter it in the Neolithic. Activity at marginally located causewayed enclosures, with its frequent non-rational elements ([Andersen](#), this volume), had possessed the germ of such festival-pilgrimage, but material culture, with a few exceptions (e.g. in Wessex), remained predominantly local. By the middle Neolithic, however, large-scale clearances suggest communal grazing and perhaps transhumance. These locales are likely to have been elevated as symbolic points of reference—arenas for seasonal social interaction invested with emotional attachment and marked at significant junctures by monument construction ([Barclay and Hey 1999](#), 70–71; [Noble 2006](#), 183–193). Attendant iconic features such as conical hills and mountains, caves, springs, and confluences, which are regarded as hierophanies worldwide (places of communication between this world and upper or lower 'realms' ([Bradley 2000](#))), would thus have entered the consciousness of a wider community.

Dorchester upon Thames is notable in this regard. In addition to the adjacent confluence of the Thame and Thames, two very distinctive hills dominate the flat plain here and are visible up to 20km away ([Loveday 1999](#)). Their form recalls similar hills/mountains that in the

Celtic west often carry the name paps (breasts) (e.g. Paps of Anu, Co. Kerry, Ireland). It is quite common, particularly amongst hunter-gatherer groups, for deities and ancestors to be recognized in the topography. Direct approach to such sites, however, is usually restricted to shamans/medicine men who may heighten their jurisdiction over spiritual spheres by undertaking a vigil at the perceived hierophany—the ‘vision quest’ of indigenous North Americans (Reeves 1994; Bradley 2000). Knowledge of that revelation would be pivotal to increasing the renown of place, as indeed it is in the world religions, and to encouraging group engagement in monument building.

Shamans in their role as negotiators with the ‘others’ are also closely associated with achieving individual goals, in particular the cure of disease, but this function was, and is, enacted at domestic or village level, often utilizing local sacred springs. It appears not to have been an early motor for pilgrimage: only in the Roman period did local spring shrines associated with healing develop a certainly inter-regional aspect (Woodward 1992, 53, 58). As with indigenous religions worldwide, Neolithic pilgrimage ceremonies seem certain to have been conduits for common, not individual, advantage.

To these three elements fuelling early pilgrimage—seasonal assemblies, transhumant/pastoral attachment to distant iconic landscape, and vision questing—can be added a fourth that could further heighten a sense of place: encounter with evidence of earlier ritual activity. A number of postholes of Mesolithic date have now been recorded in Britain (Allen and Gardiner 2002). A feature within henge A at Llandegai, Gwynedd, appears to have determined the orientation of that monument (Lynch and Musson 2004, 36, 39), and the alignment of the large posts found under the car park at Stonehenge is effectively identical to that of the Greater Cursus 700m away. In neither case can the posts have survived the three to four millennia separation. Other elements must have perpetuated memory of these features. In the latter case, the fact that the nearby Heel Stone, alone amongst the substantial stones on the site, attracted no finishing suggests it could also be of considerably earlier date and was thus sacrosanct. That may be equally true of similar standing stones elsewhere (e.g. several of the rare Mesolithic finds from Orkney come from the Stenness area (Noble 2006, 173), where the Watch Stone marks the causeway between the lochs).

Cult site development

Activity around the tallest monolith in the British Isles at Rudston in eastern Yorkshire provides one of the clearest pictures of cult

development. The standing stone is boxed around by four cursuses with combined lengths in excess of 9,730m. Along with the huge Dorset and Greater Stonehenge cursuses, these are the largest in a tradition of massive monuments and clearly exceeded the labour and surplus land capacity of a purely local community. In view of their house referencing plans and long mound antecedents it seems probable that they materialized greatly expanded group identities generated through assemblies, festivals, and collective labour (Loveday 2006a). Rudston may additionally have been marked by a natural phenomenon—the springs of the very intermittent Gypsey Race that Defoe records in the eighteenth century AD unpredictably bursting out ‘with great violence, spouting up a huge heighth’, causing awe and foreboding amongst the local population (1971, 531–532). Powerful male and female elements were perhaps perceived in the conjunction of monolith and springs, conceivably elevated to the union of earth and sky deities familiar worldwide from creation myths. The fact that the monolith is of axe-like shape gives additional significance to the remarkably dense concentration of axes found in the surrounding area. Group VI stone axes, highly specialized waisted flint axes, and polished rectangular flint ‘knives’ achieve their densest concentrations here, the former coming from the highest points in the Lake District 200km west (Bradley and Edmonds 1993), the latter two from local flint deposits but finding their closest morphological parallels in European copper flat axes.

Importantly, waisted axes occur as grave goods with a novel feature of the region—burials of fully articulated individuals under round barrows (Kinnes 1979). They have been dated to 3300–2900 BC, overlapping or just subsequent to most southern cursuses (Barclay and Bayliss 1999; Loveday et al. 2007; Gibson and Bayliss 2009). Although there are no dates from the Rudston cursuses, it seems unlikely that the elevation of individuals to positions justifying separate burial with fine grave goods was distinct from the great monument complex. Indeed that process may have centred on ritual control (Loveday 2009). Since the belief that ritual powers are hereditary and thus the monopoly of particular lineages appears older than kingship (Mair 1977, 24–25), a person belonging to a lineage that was identified with the cult site (e.g. the Quraysh at Mecca), or who was championed by its elders, would appear particularly favoured for elevation. Sanctioning at an inter-regional gathering would avoid the perception of sectional interest. Sacral-kings personified their kingdom and ensured the fulfilment of collective ritual objectives identical to those at the heart of the festival-pilgrimage phenomenon—the harmonization of natural and social worlds that guaranteed fertility and welfare for all (Quigley 2005). But why might such a

development have occurred? [Drucker-Brown \(2005\)](#) has suggested that it was ethnic heterogeneity that distinguished the former Mamprusi kingdom in Ghana from neighbouring chiefless or non-centralizing societies whose political organization rested on the assumption of common kinship. Kingship in Africa is often associated with confrontations of diverse peoples that are resolved by the kin-like relationship with *all* his people conferred on the king at his installation ceremony, a situation aided by the fact that founding kings are often recorded as outsiders ([de Heusch 2005](#)).

The unusual situation of two apparently contemporary collective burial traditions (beneath long and round mounds) and two ceramic traditions in eastern Yorkshire in the mid-fourth millennium BC chimes with this picture ([Harding 1996](#)). In addition, the presence of outside elements is hinted at by a number of items that now make their first appearance and possess continental antecedents: boar tusk blades, antler maceheads, ochre, necked globular flasks. These could relate to the suggested arrival of copper axes in Britain ([Loveday 2009](#)). Control of both the ceremonial at an inter-regional sanctuary and prestige items would be vital to a perception of ‘otherness’ and membership of such an elite might be signalled by possession of a flint copy of a rare copper axe.

Across southern England cursus complexes with their concentrations of hengiform sites (arguably in many cases plough-raised early round barrows) appear to have materialized new ideas. The fact that they display the common pilgrimage phenomenon of replication ([Fig. 24.1](#)) points to long-distance articulation rather than spontaneous regional invention at communal pasture locales. That is also true of the unprecedented expansion of one ceramic tradition—Peterborough Ware—to cover almost all of Britain south of the Yorkshire Wolds. Its recovery (albeit rarely) from the primary levels of cursuses in England lends weight to the idea that pilgrimage was the agency underlying convergence ([Loveday 2006a](#), 154–157). Rituals, dancing, and feasting at a distant centre can overcome provincial fears and antagonisms, whilst collective involvement in monument construction may cement a broader identity. Cursuses, with their vastly expanded house-like plans, seem likely, then, to have been metaphors for new expansive genealogies, encouraged or usurped by individuals claiming ritual power.

LATE NEOLITHIC BRITAIN (C. 3000–2400 BC)—AN AGE OF IDEOLOGY

The advent of a new ceramic—Grooved Ware—seems on current

evidence to have ushered in a marked and, perhaps, sudden change. All burial evidence (individual and collective) now disappears with the exception of rare cremations, a single ceramic tradition covers the entire British Isles, new monument types (post circles, stone circles, and henges) proliferate, a distinctive iconography appears (spiral and circular elements combined with lozenges and zigzags), pit deposits often become highly structured, and feasting characterizes some major monument complexes. An all-pervasive ideology is indicated (cf. Harding, this volume).

The domestic context

Hearths were the primary, defining elements of house construction at Barnhouse in Orkney and aligned toward the annual solar extremes (Richards 2005, 60), whilst the consistent placing of a ‘dresser’ (shrine?) opposite each house entrance could have fulfilled a similar ritual requirement. In the south, carefully selected and placed deposits in pits located adjacent to shallower features with fills of mundane, abraded material point to small-scale household rituals (e.g. an axe and a pig’s jaw at Down Farm, Woodcuts, Dorset (Green 2000, 69–71); three large cobbles covered by smashed, decorated pottery of varied forms placed in a matrix of charcoal-rich soil at Yarnton, Oxfordshire (Hey et al. 2003, 86–87)).

Clear religious iconography now appears. Simple criss-cross markings (at Skara Brae, Orkney) might be dismissed as decorative doodles, but elaborate engraved and pecked designs of triangles and lozenges have been found with such markings at Ness of Brodgar on stones often intentionally hidden at key moments in a building’s history (Thomas 2014). A broken slab (200mm by 135mm) found in a very large pit containing abundant Woodlands-style Grooved Ware at Rothley, Leicestershire, was undoubtedly deliberately decorated (Fig. 24.2). The lightly incised composition includes eyebrow and oculi elements within a frame that confirms deliberation (Cooper and Hunt 2005). The resultant face depiction finds an approximate parallel in carved chalk drums from Folkton, Yorkshire, but more strikingly in the small ‘face slabs’ of southern France and Italy and the schist plaques of Iberia (d’Anna 1977). Whilst the missing organic component could be critical, it is noteworthy that oculi-like designs, in the form of linked (spectacle) spirals, dominate the artistic repertoire of Orkney. Interestingly this motif is absent from Irish passage tombs, normally regarded as the source of the Orcadian tradition, but finds a close parallel in spectacle spiral ornaments of copper circulating amongst Alpine communities at this time and depicted on a statue stela from Sion, Switzerland (Loveday 2004). Alison Sheridan (2004,

17), arguing in favour of long-distance connections in the Neolithic, has drawn attention to genetic evidence that indicates the distinctive Orkney vole (found at Skara Brae and the Links of Noltland) can only have arrived from either France or Iberia travelling, it seems, in a single step ([Thaw et al. 2004](#)). Plausibility is given to the idea of such long-distance seaborne contact by the close connections of the exotic decorative style of the tomb of Gavrinis, Morbihan to elements at Knowth, Knockroe, and Newgrange (K52) in Ireland ([O'Sullivan 1997](#)), itself set against a background of more generalized Iberian elements in the Irish repertoire.

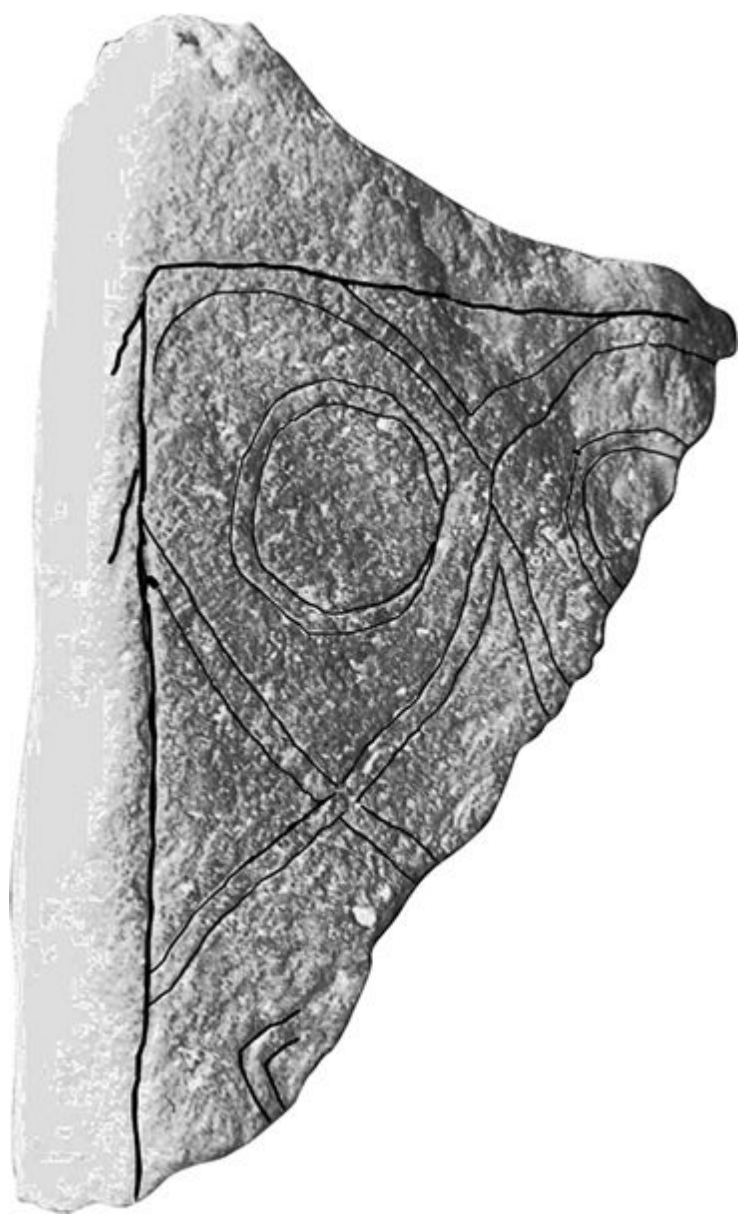




FIG. 24.2. The incised slab from a Grooved Ware pit at Rothley, Leicestershire.

©Courtesy of Leicestershire University Archaeological Services.

Orkney—a paradigm

Dates potentially as early as 3400 BC leave little doubt that the Grooved Ware phenomenon, which was to cover the British Isles c. 2800–2400 BC, originated in Orkney. [Renfrew \(1985, 255–256\)](#), seeking to explain the associated monumental florescence there and

its interconnections, was the first to propose pilgrimage as a mechanism. He couched his discussion in terms of equivalence—peer polity interaction—but a number of novel and highly distinctive features (e.g. drains and ovens in houses; tub-like flat-bottomed and scalloped rim pottery), when coupled with the presence of amulet-like pendants of Orcadian-style pestle maceheads in Irish passage tombs and the spread of the Grooved Ware ‘package’ southwards in Britain, point to a more one-sided relationship. But why originating this far north?

Agricultural advantage over the neighbouring Caithness coastal plain or Aberdeenshire seems implausible, as does geographical nodality at this extreme. But the islands do possess one notable feature—liminality. This would have been most dramatically obvious to those following the eastern seaboard where Grooved Ware is in fact concentrated. There, only the diminutive Farnes lie offshore until the coast’s dramatic westerly turn at Duncansby Head. The fact that from this point, on the brief luminous night of midsummer, the sun appears to descend into and then rise again from Orkney (solar maxima broadly aligning with its western and eastern extremities) is likely to have increased the otherworldly aspect of the archipelago and the threshold (*limin*) quality of the Pentland Firth. On entering Scapa Flow, the great inland sea of Orkney, the iconic portal-like profile presented by the hills of Hoy probably confirmed this; it is surely no coincidence that the major Stenness-Brodgar complex is situated in that part of the main island where this dividing southern skyline dominates (Fig. 24.3). Circumstantial indications of possible precocious copper working by Grooved Ware users (Loveday 2004) suggests a motive for intrusion by outsiders—the quest for an elusive material with properties of the sun on islands seemingly uniquely connected with it, perhaps in stories spread south on a coastal information chain. It also suggests the nature of the esoteric knowledge that would set them apart as ‘others’ in a land already possessed of a thriving population. Construction of an exotic ceremonial complex to enshrine an attendant ideology would be expected.



FIG. 24.3. The profile of the island of Hoy seen from the Stones of Stenness, Orkney.

‘Maes Howe is one of the supreme achievements of Neolithic Europe and stands apart because of its very excellence’ (Henshall 1985, 96). That excellence has now been demonstrated by excavation to have been shared with structures in the neighbouring settlements of Barnhouse and the Ness of Brodgar (Brophy, this volume), the latter site and the tomb sharing the extremely unusual feature of chisel-dressed (in addition to pick-dressed) stonework. Structure 10 of the final major phase at the Ness of Brodgar closely matches the great tomb in size and plan, and, significantly, was aligned upon it. The huge numbers of cattle bones placed into its surrounding paved passage, perhaps following a ‘decommissioning’ feast, confirm its ritualized role (Card 2010). The conceptual roots of Maes Howe have generally been assumed to lie amongst the Irish Boyne tombs, but their construction is crude in comparison and there are differences of burial rite, tomb concentration, and ceramic tradition. Viewed independently, Maes Howe presents most convincingly as a skeuomorph of a timber chamber—great beams of rock being employed to lock the sides together in preference to smaller, more manageable pieces, and mighty, but structurally irrelevant (Richards 2005, 245), corner buttress stones seeming to imitate roof pillars, perhaps symbolically (e.g. as world pillars). As would befit elements of a formative cult centre, similar quartet settings suggest replication

far afield in later Grooved Ware contexts: in wood at Durrington Walls in Wiltshire, Down Farm in Dorset, Dorchester upon Thames XIV in Oxfordshire, and Knowth in Co. Meath, and perhaps in stone close to the great Hindwell enclosure in Powys. Interestingly, marine shell has been recorded from all the English structures and as a dominant ceramic inclusion (Cleal et al. 1994).

The mound of Maes Howe itself seems likely to be echoed by the great barrows that were constructed alongside several henge and henge-like enclosure complexes (e.g. Dunragit, Galloway; Gib Hill and Arbor Low, Derbyshire; Knowlton, Dorset; Marden and Avebury, Wiltshire), whilst enlargement of the Duggleby Howe round mound to proportions quite distinct from normal middle Neolithic practice (Kinnes 1979) probably also dates to this period. Repetition suggests we must look beyond functional, site-specific roles (e.g. as raised viewing platforms) to a deeper meaning embedded in Grooved Ware cosmology, perhaps as representations of a first earth/primal mound. The Stones of Stenness (3000–2800 BC) also belongs amongst the earliest henges (Harding 2003, 7–23). These monuments enshrine a major symbolic shift from linear to circular monuments. This may in part relate to a change of house plan (Richards et al. 2005), but domestic space is as likely to reflect as to generate core cosmology. In view of the solar emphasis incorporated in many of the new monuments' orientations, the sun disc probably has a stronger claim.

Transmission

Sheer distance and the rigours of the journey by sea must have severely restricted the number of successful 'pilgrim' encounters with the Orcadian complex. That would undoubtedly have added greatly to the renown of the achievement and could have aided social elevation (cf. Helms 1988; Kristiansen and Larsson 2005), but direct transmission of a new ideology from this northern outpost is also credible. The Oro cult, spread from Raiatea to other Polynesian islands in the eighteenth century AD, furnishes a possible parallel. Priests at Opoa (the claimed birthplace and dwelling of Oro) organized a society of travelling performers to spread the new cult with its claimed supernatural powers. Chiefs of other islands vied for the patronage of these powerful and demanding specialists and used membership of the cult to justify their own political elevation, forcing the construction of monumental *marae* to Oro copying that at Opoa (Bellwood 1987). The clear structuring of many pit deposits that appears with Grooved Ware in Britain (Green 2000, 69–71; Garrow 2007, 14–15) strongly suggests a magico/religious element not previously in evidence, whilst apparent replication of the key structural components of the 'package'

noted above could likewise result from transmission of the origin myths of a cult.

In this process it could be predicted that the major cursus complexes would have been targeted as secondary centres. Large ceremonial henges laid out across or beside earlier cursuses seem to indicate this (Fig. 24.1). One complex where this is evident, Thornborough in the Vale of Mowbray, furnishes clear evidence for pilgrimage. The three massive, equally spaced henges, along with four others strung out over 43km to the south, are all but identical and of very unusual double-ditched plan (Fig. 24.4). Their closest parallel lies 300km south at the Dorchester upon Thames complex (Fig. 24.1). This strikingly recalls the pattern of monument replication along pilgrimage routes. Additional evidence comes from lithic scatters located about 1km beyond the clear zone around the Thornborough monuments. The largest of these contained few tools but a range of materials from distant sources, including low-grade Pennine chert that is unlikely to have been traded or to have been a material of choice locally. A transitory influx of distant people is suggested (Harding 2003, 62, 99), probably associated with ceremonies related to the winter solstice sunrise alignment of the monuments (Harding et al. 2006). The potentially late date of this type of henge, however (Whittle et al. 1992, 191), advises caution in assigning a role in primary ideological transmission. Rather, continued respect and small-scale construction is initially indicated (e.g. by a hengiform site and a post circle dated c. 2900–2500 BC placed along the axis of the Dorchester upon Thames cursus). New ideas perhaps first spread through appeals to more localized, less dominant interests and through monuments that have more ephemerally scored the landscape—post circles and post enclosures (Gibson 2004).

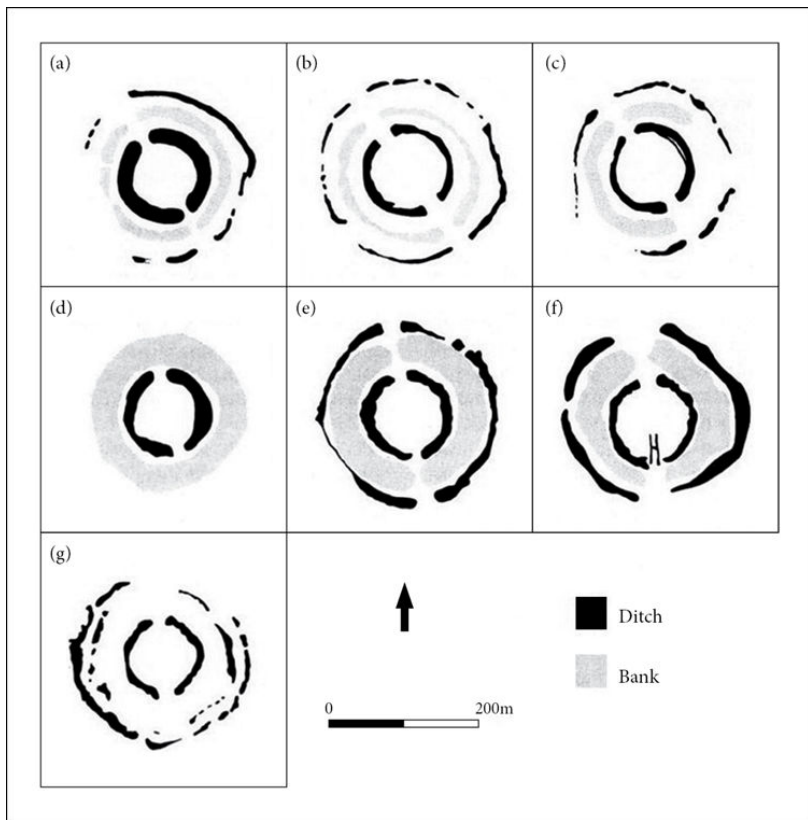


FIG. 24.4. Henges in the vales of Mowbray and York.

(A. North Thornborough; B. Central Thornborough; C. South Thornborough; D. Nunwick; E. Hutton Moor; F. Cana Barn; G. Newton Kyme) © Courtesy of J. Harding.

Wessex

Rapid development in the mid-third millennium BC, which witnessed the construction of the great henge enclosures of the Wessex chalk, resulted in far closer placement of monuments than had been the case in the middle Neolithic: c. 30km (15km in the case of Marden) as against 90–120km between the great cursus complexes of the Midlands. This is almost identical to the spacing of medieval market towns in Wessex and suggests comparably local roles, probably as the ceremonial centres of separate polities. It need not imply permanent residence, as evidence for extravagant seasonal consumption, but not production, at the extensive settlement at Durrington Walls demonstrates (Parker Pearson 2008). Assembly in association with events tied to the solar extreme alignments built into its Southern Circle seems probable (Parker Pearson et al. 2007), but patterning of deposits there, and at other Wessex henges, points to additional

complex associations and ideas (Bradley 2000, 123–127). The fact that the mega-henge permutation of great post enclosures—usurping ceremonial architectural form—is restricted to Wessex could instead suggest that these sites represent regional centres of a single galactic polity where power was legitimated through monopolization of the supernatural. Pilgrimage in such a context may have been indistinguishable from tribute assembly (cf. Arcona in the eleventh century AD: Stupecki 1997).

Construction of the ultimate cult centre—the sarsen structure at Stonehenge—leaves little doubt regarding unified control of the prodigies of labour and skill it materialized. Motivation behind the project remains uncertain beyond production of an eternal, solar-orientated monument in the Wessex post circle tradition; suggestions that it functioned as a pilgrimage shrine for healing (Catling 2007) must be questioned in view of the evidence for the nature of early pilgrimage adduced above. It may not be coincidental, however, that the smaller diameter of the sarsen circle (30m as against the consistent 38m of the great Wessex post circles) finds close parallel in a site that almost uniquely possesses tabular stones of comparable height—the Stones of Stenness. Given the suggested germinal role of the Orcadian ceremonial complex in Grooved Ware ideology, is it possible that the sarsen structure records usurpation of the origin myth? Construction of a new *axis mundi* combining elements of both Wessex post circles and the cult progenitor would equate esoteric cosmological (and possibly metallurgical (Parker Pearson 2008)) knowledge with mythic ancestry. And, as the monument survived (or was completed) after the ideological change associated with Beakers had led to a return of individual burial, we can track the geography of its pilgrimage assembly in the surrounding landscape through the coombe-edge placement of round barrows (Loveday 2006b).

CONCLUSION

By focusing on the monuments that characterize Neolithic Britain it has been possible to record the increasing complexity of the religious ideas that permeated life—from kin-based formulations, through kin-enlarged beliefs mediated by and transmitted from, pilgrimage centres, to an expansive, intensely ceremonial ideology that seemingly relegated ancestry in favour of a solar focus. Pilgrimage was the vital agency of change. Its material outcomes—intensity of construction, monumentalization and long-distance replication—can be read more widely: in the 60–80km distance across which materials were brought to embellish Newgrange; in the exceptional and varied tombs sited

close to the *metas* resembling a human head at Antequera in Andalucía, and in the concentration of different monument types in the Carnac region; in the replication of Knowth at Knockree (O'Sullivan 2004), and conceivably the great menhir-capped Table des Marchand by the idiosyncratically massive portal dolmen of the Irish Sea zone. Perhaps most importantly, pilgrimage opens up the possibility of recognizing ultimate prototypes—the birth places of the origin myths that generated ritual.

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Materiality and Social Relations

CHAPTER 25

INVENTION AND EUROPEAN KNAPPING TRADITIONS*

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KNAPPING TECHNIQUES

During the Neolithic, the making of tools from flint and other siliceous rocks was organized according to two great conceptual schemes. In the first, the flakes and, more commonly, blades detached from a prepared core were either used as such, or retouched further into specific tool shapes. In the second, blocks of flint were shaped into tools, mostly by bifacial reduction. The second method served mainly to produce rough-outs for axes. This article will focus on the knapping traditions connected with blade production. The different techniques, i.e. the physical actions used in flint knapping, together with the underlying conceptual schemes (often referred to as methods) can be studied by merging the results of three different approaches ([Inizan et al. 1992](#); [Beuker 2010](#)):

- observing characteristic traces present on blades, cores, and knapping waste in archaeological assemblages ([Andrefsky 1998](#));
- conjoining or refitting lithic material recovered from knapping sites ([Cziesla et al. 1990](#));
- replicating blanks and tools by systematic experiments ([Gallet 1998](#)).

Knapping techniques are defined on the basis of how force is applied, the nature of the knapping tools, and the gestures made by the knapper ([Inizan et al. 1992](#)).

The main techniques used for Neolithic blade production are:

- direct percussion* with a soft, elastic mallet, made from antler, bone, or hard wood;
- indirect percussion*, in which an intermediate antler or bone tool (punch) is placed on the platform and then struck with a hard or soft hammer ([Figure 25.1](#));
- pressure*, whereby the blade is detached from the core by applying pressure on the platform with a ‘flaker’, basically a handle with an inserted tip made

of antler, bone, or even copper (Figure 25.2);

- *direct hard hammer percussion*, in which force is applied directly with another rock. This technique is only rarely used in Neolithic blade production.

Unfortunately, the identification of knapping techniques in archaeological assemblages is not quite as straightforward as one would like. Experiments have demonstrated, on the one hand, that different techniques can produce identical or at least highly similar characteristics and, on the other hand, that a single technique may provide variable results (Tixier 1982; Gallet 1998; Pelegrin 2006). To make matters even more complicated, reports by different authors on different series of experiments are not uniform—and sometimes even downright contradictory—in their assessment of several attributes considered characteristic for a given technique, among them the shapes and sizes of butts and bulbs of force, or the longitudinal curvature of the blades (e.g. Gallet 1998; Mateiciucová 2003; Pelegrin 2006). Despite this caveat, most researchers would agree that inferences about knapping techniques, based in part on expert judgement, are feasible.

The most important distinguishing characteristics have to do with the angle between the platform (on which force was applied) and the core face (the surface from which blades were detached). The corresponding angle, between the butt and the dorsal face, on blades is commonly called *angle de chasse*. Cores suitable for direct percussion with a hard or soft hammer tend to display an acute angle between the striking platform and the core face. Consequently, the blades possess an acute *angle de chasse*. For indirect percussion, the cores need to be ‘orthogonal’, i.e. with an angle between platform and core face of c. 80-95°. Cores worked by pressure flaking may be either of the acute angle or the orthogonal type, and the *angle de chasse* on pressed blades varies accordingly. However, pressed blades always are extremely standardized, with parallel edges and arrises.

In practice, it is easy to distinguish direct soft hammer percussion from the other two techniques, either on the basis of the *angle de chasse* or because pressed blades are much more standardized, with very parallel edges and an almost straight profile. The distinction between pressed and punched blades is relatively unproblematic when the former possess an acute *angle de chasse*. Where orthogonal cores were used, the decision is less easy, as the differences are more of degree than of kind: punched blades tend to be thicker, ‘heavier’, less slender, and less regular than pressure-flaked blades of a similar length (Gallet 1998; Pelegrin 2006). Thus, the blades of the Blicquy culture have been alternatively described as being pressed or punched (Cahen et al. 1986; Allard and Bostyn 2006).

To execute a given technique successfully, a number of secondary

‘technical procedures’ (Inizan et al. 1992) are needed. They concern, amongst others, creating one or several crests (ridges) to guide the first blade removal and to predetermine the shape and curvature of the core face; preparing and maintaining the desired angle between platform and core face; rejuvenation of the core to correct knapping errors; and even the careful polishing of the blades’ surface before applying final retouches. Most of these actions may be performed in several ways, independent of the actual knapping technique, and they leave specific traces on cores and blades. For instance, maintaining the correct platform angle, removing overhangs of previous negatives, and preparing the surface for the next impact may be achieved by trimming or dorsal reduction (removing microflakes from the core face), by faceting (detaching small flakes from the platform), or by rubbing or pecking of the platform and the ridge between platform and core face (Whittaker 1994).

Specific combinations of these procedures may be regarded, to a large extent, to result from technological choices (Lemonnier 1993) rather than technical necessity. In that sense, the way the main debitage technique and supporting technical procedures are combined makes it possible to recognize knapping traditions, with all their implication for the transmission of skills and identity, through time and space—even allowing for some uncertainty regarding the actual technique employed.

Although direct percussion with a soft or hard hammer was in use for the domestic production of blades and flakes throughout the Neolithic (Wechler 1992; Allard and Bostyn 2006), the other two techniques merit greater attention, as both were applied in increasingly complex *chaînes opératoires* to manufacture increasingly longer blades, subsequently shaped into increasingly sophisticated tools. Of the two, indirect percussion seems the more traditional, its different styles resulting mostly from gradual transformations in technical procedures. Within the pressure tradition, however, a number of real innovations—involving not only the invention of a new technique, but the adoption of its results by the community (Ottaway 2001)—have been recognized.

Pressure flaking

Pressure flaking as a technique for producing small blades and for retouching tools was invented during the Upper Palaeolithic (Inizan 2002), and was also practised in the Mesolithic—e.g. in the Scandinavian Maglemosian (Sørensen 2006) and the western Mediterranean Castelnovian (Binder 1998). However, its earliest Neolithic occurrence in Europe, in seventh millennium Greece, seems

to have been inspired by Anatolian examples (Perlès 2001).

The first innovation connected to pressure flaking is the controlled, intentional heat-treatment of cores, which changes the physical properties of the raw material and facilitates the detachment of bladelets (Binder 1998). It is first encountered in early and middle Neolithic assemblages in Spain (Martínez-Fernández 1997), and became especially popular during the fifth millennium in the southern French Chasséen. There, heat treatment and pressure flaking interface with indirect percussion, not only as contemporary separate traditions, but sometimes as part of a single reduction sequence in which orthogonal cores first produced medium-sized punched blades and subsequently were reduced in size, given an acute platform angle, and heat-treated. Both the punched blades and the cores were then transferred to regional settlements (Léa 2005). The necessary force may have been applied with small, hand-held flakers—such as that found with the Hauslabjoch Iceman (Spindler 1994), made by inserting an antler spike into a wooden handle.

For the second innovation, no direct archaeological evidence exists as yet. In many areas, however, the pressure technique seems also to have been used to manufacture very long blades of over 40cm. As experiments and theoretical considerations of physical laws show that this would have involved forces far exceeding those a human body can provide, it is assumed that these blades were made using compound flakers, equipped with a levering device to multiply human strength (Pelegri 2006).

The third innovation, closely connected with the second, concerns the use of copper-tipped levers. Initial indications for their use were derived from the recognition of characteristic cracks on the butts of both archaeological and experimental long blades. Subsequently, in at least one case chemical analyses revealed the presence of actual copper traces on the butts of pressed blades (Renault 2006), and possible copper tips were recovered from relevant archaeological assemblages (Manolakakis 2007). The oldest of these lever-flaked ‘super’ blades are documented in Copper Age north-east Bulgaria during the second half of the fifth millennium. Extraction and manufacturing sites have been discovered close to the Kamenovo tell near Ravno (Manolakakis 2007), from where the blades circulated over distances of up to 900km. Later on, the tradition was transmitted further north to the Ukraine and Poland (Balcer 2002; Migal 2006). Ultimately, it reached southern Scandinavia, where from c. 2500 BC onward it was used in the final stages of the manufacture of flint daggers (Apel 2008).

Similar long and very long blades, made from a great variety of high-quality flint types, were made in Spain, southern France,

Sardinia, and northern Italy from the first half of the fourth millennium onward ([Vaquer and Briois 2006](#)). They, too, are produced by copper-tipped levers, at a period when early metallurgy first appears. Often they were retouched into dagger-like shapes, sometimes partly polished and carrying extremely careful parallel surface retouches, and subsequently distributed over large areas. Some daggers from the Lake Garda region in northern Italy crossed the Alps to reach south-eastern Bavaria, inspiring the manufacture of daggers and other cutting tools from bifacially worked tabular flints, as local raw material constraints precluded long blade manufacture ([Tillmann 1993](#)). Similar technological short-cuts have been documented in southern France and Spain ([Vaquer and Briois 2006](#)) and show the importance of long-range networks and the emulation of prestige items for local practices and identities.

Given the considerable spatial and cultural distance between the early south-eastern and south-western European production areas, independent invention of both lever-pressing and the use of copper tips cannot be excluded. In both areas, evidence for the experimental stages of trial and error, and for the gradual acceptance of the new technique and its integration into existing technological and symbolic frameworks ([Lemonnier 1993](#); [Ottaway 2001](#)), is still lacking. Its appearance in the western Mediterranean, at a time when copper daggers were still virtually unknown there, suggests that the intrinsic quality of the copper tip, enabling knappers to achieve long and regular blades more easily, may have been appreciated and led to their use before the appearance of copper daggers caused rivalry between flint and copper in the realm of prestige ([Renault 1998](#)).

Indirect percussion

The punch technique is rooted in late Mesolithic knapping traditions and was widely practised in both the Mediterranean and the Danubian current of Neolithization. In the former, it is best known from the Cardial ([Binder 1998](#)); in the latter it first occurs in the Starčevo-Körös complex. A good example of its gradual transformation is the LBK tradition of central and western Europe. In the earliest phases of the LBK culture, the procedure chosen for core preparation is indistinguishable from that practised by late and final Mesolithic groups ([Gronenborn 1999](#); [Mateiciucová 2003, 2008](#)): before each blade was detached, fine-tuning took place by removing tiny chips from the striking platform. As LBK settlement spread westwards, new knapping procedures were devised, apparently independent from indigenous hunter-gatherer practices ([De Grooth 2008](#)). They involved increasingly careful initial preparation of cores by means of one or

more crests; rather perfunctory trimming of the core face; centripetal platform faceting; and the systematic, almost exuberant removal of whole series of rejuvenation tablets (Figure 25.3)(Allard 2005). These procedures continued to be practised in various combinations by the later LBK and most of the groups succeeding it (Allard and Bostyn 2006), although a disruption occurred with the Cerny group. Core length gradually increased, too, and ultimately, whenever good quality flint was available, medium-sized and long blades were produced from pyramidal or cylindrical cores reduced (semi)revolvingly.

Application of the punch technique seemingly got a new impetus with the Michelsberg culture. At knapping sites connected to flint mines, such as Rijckholt-St. Geertruid (Netherlands) or Spiennes (Belgium)—where an antler punch was found among knapping debris—long blades of 15–25cm were manufactured all through the fourth millennium. The cores were given a flat back and a single, wide core face, which was opened after systematic preparation of three crests. The lateral ones were needed to control the curvature of the core face, and the frontal one served to guide the first blade detachment.

This same type of core is thought to represent the earliest long blade production in Touraine and Poitou, the region around Le Grand-Pressigny flint source. There, shortly before 3000 BC, the punch tradition underwent its final, and most remarkable, transformation with the creation of the *livre-de-beurre* (pound of butter) blade cores. As at Spiennes and Rijckholt, *livre-de-beurre* cores are opened on a wide front and have a flat back; they are, however, much longer, often over 40cm. Moreover, they had just two lateral crests, shaped so that the distal ends of the preparation negatives met at the central axis of the intended core face, forming a ridge to guide the first blade. Before every blade detachment, two small flakes were removed on the striking platform, creating a ridge that was then roughened with a special pecking stone. Experiments indicate that super-long blades could only be detached by indirect percussion using a heavy stone hammer wrapped in leather (to soften the blow) and a specially shaped antler punch, and resting the core on an elastic wooden support to absorb the shock of the heavy blow (Pelegriin 2002).

On a much smaller scale, this characteristic technique was also applied in several other regions, often at a distance of hundreds of kilometres from Le Grand-Pressigny, notably in the Bergerac (Delage 2004), in the Vercors (Riche 2006), and at Romigny and Lhéry close to Reims (Delcourt-Vlaeminck 2004), suggesting that some of the knapping specialists may have been rather mobile, and in part were actively involved in long blade distribution (Pelegriin 2002).

SOCIAL CONNOTATIONS

Until recently, many studies of lithic production were mainly concerned with the technological and chronological aspects discussed in the previous section. During the last decades, however, anthropologically inspired approaches increasingly regard flint tools not only in technological or functional terms, but as objects endowed with value and power, playing an important role in constructing individual and group identities (Barfield 2003; Van Gijn 2010). One of the key issues is the position of the flint knappers in their communities, and more specifically the question of specialization (Torrence 1986; Olausson 1997). It is generally—although mostly implicitly—assumed that acquiring and processing of flint was a predominantly male activity. As ethnographic accounts (e.g. Pétrequin and Pétrequin 1999) provide some justification for this view, I tend to adhere to it (but see e.g. Gero 1991 for a different perspective). Basically, the term ‘specialist’ refers to those people who perform complicated tasks more successfully than others and, because of their special skills, tend to perform them more often as well, whilst also coordinating the work of less experienced team-mates. Moreover, they consistently produce objects for people outside their own household. Because of their special skills, specialists may earn respect and acquire status within their community—there are, however, very few cases of persons identifiable as flint knapping specialists through grave goods (cf. Lech 1980; Korek 1986).

During the entire period, the most widespread type of specialization was regional or between groups. This distinguishes between producers and consumers, the former being involved more actively in the acquisition of raw material, the initial stages of core preparation, and/or blade production (Lech 2003). An early example is the circulation of obsidian in Greece (Perlès 2001). From the mid-fifth millennium onwards, there is increased evidence for within-group specialization as well, i.e. a situation in which the division of labour within a given community was not based on age and sex alone, and accordingly not all households participated to the same extent in lithic production.

Other relevant topics are the examination of the social relations of production, distribution, and consumption of flint tools, and the distinction between routinely produced domestic tools and objects possibly invested with additional, symbolic or prestige value, in part because their manufacture was time-consuming and required special skills.

A well-founded assessment of these issues cannot be based on a single production site or settlement, but should integrate data from extraction and production sites alongside the settlements of producers

and consumers (Torrence 1986). Unfortunately, in many cases these conditions are not yet met (e.g. Léa 2005).

An example of such an integrated approach for an early Neolithic context is the Linearbandkeramik of central and western Europe. Here, flint knapping basically was a domestic activity in which all households participated (De Grooth 2007). All Bandkeramik groups preferentially acquired high-quality raw material from considerable distances, rather than make do with local lower-quality rocks. Moreover, they established multidirectional long-distance supply systems for distributing flint and other siliceous rocks, which were maintained for many generations. Ultimately, these networks connected nearly all Bandkeramik settlement regions (Burnez-Lanotte 2003). In many cases, flints were passed on between different regional groups (Allard 2005; Binsteiner 2005), but social boundaries preventing contact have also been identified (Zimmermann 1995). In some regions, pioneer settlements were more actively involved in knapping and functioned as regional redistribution centres (Kegler-Graiewski and Zimmermann 2003; De Grooth 2007). Flint circulated predominantly as prepared or partially reduced cores; only at the end of the supply lines, when cores became exhausted, were blades and tools handed on. However, in the latest phases, a more differentiated pattern emerged, in which nodules and cores were transferred in one direction and blades in others (Allard and Bostyn 2006). In some settlements, lithics arriving from different directions were unevenly distributed among the household clusters (Lüning 2005); in others, at the periphery of the Bandkeramik world, flints from the core region were used more intensively for tool production than local material (Lech 2003).

Thus, the use of specific flint types may have contributed to the reproduction of identity on a household or lineage level, and to the maintenance of kinship and ancestral relations. There is no evidence, however, that flint tools as such were endowed with special values. Repeatedly, subtle changes in knapping style occurred when new regions were settled and new flint sources were being explored (De Grooth 2008). This is probably connected to a need to create a new identity for groups moving away from the ancestral homeland, changing as much of their material culture as possible without alienating the ancestors or causing the preceding generations staying in the homeland to sever supply chains (Sommer 2001).

Production, use, and deposition of long blades

In many aspects, fundamental changes in the organization of lithic production and distribution manifest themselves from the second half

of the fifth millennium onwards, especially in areas where more complex societies were emerging. Commonly, a clear dichotomy exists between the bulk of mundane domestic tools, often of low-quality flints, in whose production little skill and effort were invested, and a few exceptional tools made on standardized blades. Their manufacture, more often than not, did not take place in the settlements, but at special locations at or close to acquisition sites. This spatial concentration of procurement and manufacturing, as well as the increasingly complex *chaînes opératoires*, may well have been linked to a higher level of specialization, involving only a restricted number of craft specialists. This idea is borne out by the situation at the Ćmielow settlement in Poland, where only a few households were involved in TRB (Funnel Beaker culture) long blade production (Balcer 2002).

In most studies devoted to the organizational aspects of long blade manufacture, this is regarded as a part-time, seasonal activity, performed alongside subsistence activities (e.g. Felder et al. 1998; Balcer 2002; Pelegrin 2002; Riche 2006). Once more, the Le Grand-Pressigny area may serve as an example (Pelegrin 2002). Unfortunately, at present very little information on settlements in the area is available (Villes 2003), but one may envisage specialists living in the rather large area around Le Grand-Pressigny, where isolated examples of knapping waste occur. A maximum of 10,000 long blades are thought to have been produced there yearly, whilst the daily output of an experienced knapper could have been some 25 blades, deriving from two or three *livre-de-beurre* cores (Pelegrin 2002). Thus, five knapping teams would have needed about three months or, alternatively, 50 teams could have performed the task in less than two weeks.

It is tempting to regard the evidence from the La Creusette hoard (Geslin et al. 1980) as an indication that the latter figure is not entirely unrealistic, as its c. 130–140 blades represent a selection of c. 500–800 blades produced from 50–80 cores (Pelegrin 2002). Similar hoards of partly conjoinable blades also occur at other knapping sites. Their intentional deposition, with every knapper giving part of his production back to the earth, may be seen as the material expression of ritual, aimed at reconciliation (Edmonds 1998), or imprinting the cosmological significance of the sites on the community's collective memory (Högberg 2006), rather than as a purely utilitarian cache where blades were simply stored for future use.

In such a setting, the transmission of skills may have become more structured, too. However, as knapping traditions still persisted for centuries, the transmission of knowledge and know-how through trajectories of learning-by-doing, enhanced by myths and rituals, must

have formed a stable part of communities' routine, not only involving just a chosen few. Although some attempts have been made to distinguish the work of children and less experienced knappers (Babel 1997; Pelegrin 2006), this aspect clearly needs to be explored more fully (Bamforth and Finlay 2008). It is not easy to assess how difficult it was to acquire the skills necessary for long blade manufacture in either the punch or the pressure technique. The experiences of modern knappers cannot be uncritically projected on the past, as they had to re-invent during a short time span a range of alien methods and techniques that in prehistoric real-life conditions would have been part of a community's shared heritage (cf. Dobres 2006).

Performing the manufacture of long blades close to raw material outcrops should be seen as a means not only of minimizing time and energy expenditure, but also of stimulating inter-group activities. The congregation of large numbers of people, whose day-to-day relationships as close neighbours may well have been rather strained, could have served primarily to lessen tensions, to re-establish traditional kinship ties and reciprocal obligations, and to re-emphasize group identities. Moreover, the act of knapping would have been performed in an atmosphere of male social competition and emulation, and thus could have played a role in the construction of individual identities as well. Estimates based on experiments and refitting suggest that at Le Grand-Pressigny, every *livre-de-beurre* core would have yielded only some ten super blades, and that a skilled knapper could work two or three cores a day (Pelegrin 2002). In terms of both raw material economy and investment of labour, this seems an extremely inefficient procedure, but it makes sense when regarded as the punchers' answer to the southern French pressers' impressive expression of their social identity.

Little is known as yet of the social context and organizational aspects of long blade distribution, although conjoinable blades in depositions outside production areas indicate that it may have been a structured activity, possibly involving specialist flint knappers. The circulation and consumption of long blades, and of the tools made from them, are commonly connected with male competition and prestige exchange. Some of the evidence suggests, however, that they may have moved in more differentiated social spheres, both in a regional context and after crossing social boundaries.

At the Bulgarian Varna cemetery, the longest blades occurred in the richest graves, suggesting that they were valued precisely because of their size. In other cemeteries of the same region, however, they did not mark high-status males (Sirakov 2002), and in one example they were associated exclusively with females (Chapman 1996). Moreover, in the domestic domain the rare, imported super-long blades were

often intentionally broken to the size of locally produced blades and intensively used, for instance in plant-processing activities (Manolakakis 2007).

The situation in western Europe is equally differentiated. Both pressed and punched long blades were in part carefully retouched into knife- or dagger-like tools. Despite the martial connotation of the latter label, many of them were also intensively used in a variety of plant-processing activities (Plisson et al. 2002), and repeatedly sharpened and recycled. This was not only the case in, for example, Swiss lakeside settlements (Honegger 2001), where they could conceivably have lost their original value and social messages after moving beyond their regional context, but also closer to home—in the case of Le Grand-Pressigny, for instance, in the Paris Basin (Mallet et al. 2004). Recent microwear evidence indicates that even daggers deposited in a seemingly pristine condition in burials had been previously used in such an innocuous way (Clop et al. 2006). On the other hand, in the Single Grave culture of the Netherlands and north-western Germany, imported French daggers really were not treated as utilitarian commodities, but as valued prestige objects (Figure 25.4) (Delcourt-Vlaeminck 2004). This diversity suggests that long blades moved along multilayered trajectories, connecting different social spheres, in which the functional and symbolic aspects of consumption and distribution are best regarded not as entirely separate entities but as intertwined aspects of the same context.

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FIG. 25.2. Witold Migal's (Warsaw) experimental production of blades using the pressure technique.

(photo: Inna Mateiciucová, Brno).



FIG. 25.1. Witold Migal's (Warsaw) experimental work on blade production by indirect percussion.

(photo: Inna Mateiciucová, Brno).



FIG. 25.3. Refitted Bandkeramik blade core (L: 15cm) from Beek-Kerkeveld (the Netherlands), showing orthogonal flaking angles and large core rejuvenation tablets.

(photo: Bonnefantenmuseum Maastricht).



FIG. 25.4. Two ‘daggers’ found in the Netherlands: the smaller one on the top (Eext, L. 23.8cm) is made from Le Grand-Pressigny flint, the larger one on the bottom (Buinen, L. 25.1cm) from the Romigny-Lhéry flint type occurring in northern France. Both were manufactured by indirect percussion, carefully polished after detachment, and subsequently shaped by pressure retouch.

(photos: Jaap Beuker, Drents Museum Assen).

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CHAPTER 26

SHARED LABOUR AND LARGE-SCALE ACTION*

European Flint Mining

MARTA CAPOTE AND PEDRO DÍAZ-DEL-RÍO

INTRODUCTION

NEOLITHIC communities engaged in flint mining from very early on. These activities lasted, with different tempos, at least until the end of the third millennium BC. They took place at the very extremities of the Continent as well as at numerous places in between (Fig. 26.1). Nevertheless, considerable distances lay between individual mines or clusters of mines, suggesting that the distribution of these sites is largely, but not entirely, due to the availability of the desired raw material.

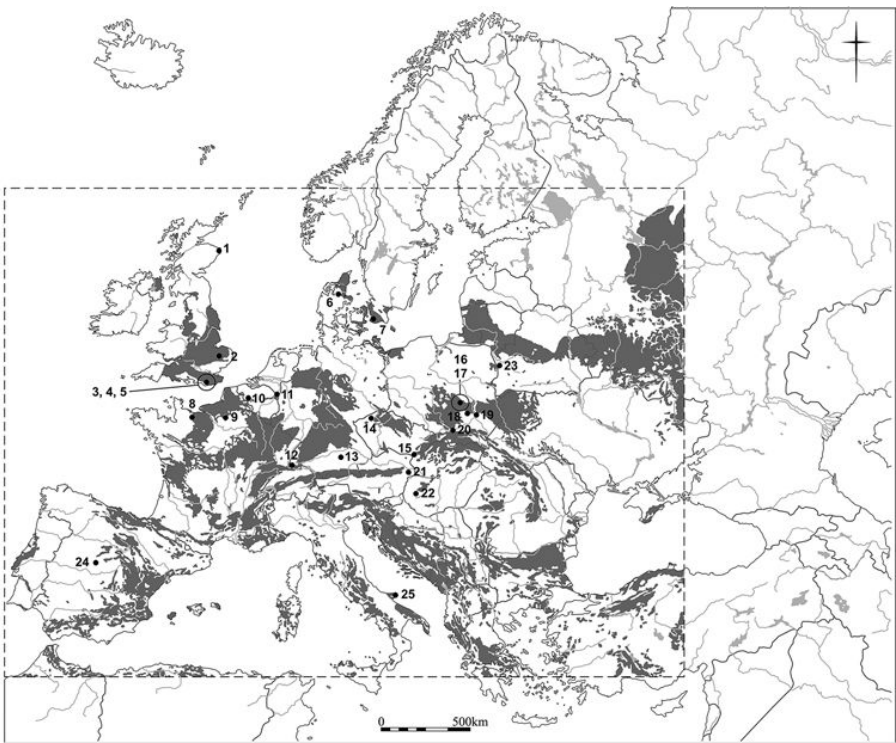


FIG. 26.1. Some of the best-known European Neolithic sites where deep mining has been documented. Their distribution is compared to the areas (shaded) defined by [Duke and Steele \(2010\)](#) as having higher probability of tool-quality lithic raw material availability: several mines (e.g. 1, 13, or 24) indicate that some areas not predicted to yield tool-quality rock did in fact have a higher potential than suggested. UK: 1, Den of Boddam; 2, Grime's Graves; 3, Blackpatch; 4, Church Hill; 5, Cissbury. Denmark: 6, Hov. Sweden: 7, Kvarnby-S. Sallerup. France: 8, Ri; 9, Jablines. Belgium: 10, Spiennes. Netherlands: 11, Rijckholt. Germany: 12, Kleinkems; 13, Abensberg-Arnshofen. Czech Republic: 14, Tusimice; 15, Krumlovský les. Poland: 16, Wierzbica; 17, Tomaszów; 18, Krzemionki; 19, Swieciechów; 20, Saspów; Austria: 21, Wien-Mauer. Hungary: 22, Sümeg. Belarus: 23, Krasnoye Selo. Spain: 24, Casa Montero. Italy: 25, Defensola.

The examination of mines in isolation can give the impression that they represent a fairly generalized and homogeneous phenomenon, with individual mines appearing to share more commonalities with each other than they exhibit differences, despite the incredibly diverse social, economic, and ideological contexts in which they occurred. This is as much due to the mining techniques required to extract flint as it is to the relative absence of a broader range of cultural debris at many mining sites, making it difficult to place them clearly within their local context. As a result, scholars of flint mining confront serious problems in trying to describe the immediate social contexts of

labour mobilization. The study of mines may inform us about what was produced, and how, but the social values and meanings attached to both the products and the manner in which they were obtained are, as could be expected, more difficult to grasp.

However, without taking a closer look at mines we would fail to notice some significant aspects of Neolithic societies. Labouring with flint involved an extraordinarily radical and enduring transformation of landscapes in contrast with the frequently small-scale, dispersed, and mobile residential patterns. Considering Neolithic life expectancy, the limited population densities, and the mean size of residential sites contemporary to many of the known flint mines, the probably ritualized acts of gathering at the mine ([Topping 2005](#)), sharing labour, performing and learning technical skills, knowledge, and know-how, must have been extremely meaningful and probably central to the construction of multiple group and individual identities. These identities, shaped through the sharing of labour practices, would have been further transmitted throughout the overlapping and frequently dynamic exchange spheres, and materialized by products such as axes and blades in a wide range of contexts beyond their local source.

The interpretation of flint mining takes at least two not necessarily opposed views. Nowadays, the most accepted of these understands the remarkably transformed landscapes and volumes of manufactured flint refuse at mining sites as a result of small-scale, part-time, maybe seasonal long-term action. On the other hand, many mines show a surprising coherence in the structure and nature of their remains, such as the lack of overlapping shafts, some systematic technical reiterations of the operative chains, sets of statistically identical radiocarbon dates dating apparently different mining events, or the refitting of refuse, that point to important contemporaneous clusters of mining shafts and galleries. This evidence suggests that some mining events did in fact involve large-scale actions, and that many mining fields were perhaps the result of the labouring of some few generations of Neolithic groups.

Whatever the extent and tempos of mining activity may have been, labouring for flint ought to have had a central role in the construction of the various kinds of Neolithic identities through time and place. These gatherings must have played an important part in constructing a sense of community during the earliest Neolithic, but also in the increased importance of socially recognized artisans and in the emergence of different social and political asymmetries.

THE WHAT AND WHERE OF EUROPEAN FLINT

Flint has been a preferred raw material for tool-making since the Palaeolithic, because when struck it splits or fractures in a reasonably predictable manner. This kind of fracture (conchoidal) generates strong, sharp cutting edges, and, depending on the artisan's skill, allows the production of a wide variety of desired tool forms. The use of flint has not been limited to prehistory, of course, being mined into recent times for construction material, 'strike-a-lights', gun-flints, or threshers. Although seemingly of little relevance to the Neolithic, this fact is critical when assessing Neolithic flint mining. Many European flint sources were mined during historical times, something which may have affected the remains of earlier mining, whilst surface traces may not always be clearly distinguishable from previous prehistoric activities. At the same time, however, historical records of the actual processes and technology of gunflint mining, for example, provide a useful yardstick with which to compare the Neolithic workings.

Flint is abundant across Europe, but its actual distribution is patchy and variable. It occurs in a variety of contexts, both primary (outcrops and buried nodular seams or tabular sheets) or secondary (gravels in river beds, beach and glacial deposits, clay-with-flints, and so on). The diversity of contexts of formation and of the subsequent geological processes to which flint has been exposed has resulted in a wide range of mechanical and aesthetic qualities. As a result, although most Neolithic communities may have had access to a range of lithic raw materials, some—with specific qualities, like, for example, the aesthetic Polish banded flint—could only be obtained in certain areas or through exchange networks. This uneven distribution of flint in general, and of the best-quality types in particular, was undoubtedly of significance in the Neolithic.

Of all the flint sources known to exist throughout Europe, many were used for procurement, and some—but not all—saw deep mining. To date, mines from the following areas have been extensively reported on in the archaeological literature:

- The English Cretaceous flint-bearing chalks, particularly in East Anglia (e.g. Grime's Graves, Norfolk) ([Lech et al. 2011](#)) and the South Downs of West and East Sussex (e.g. Cissbury, Blackpatch, or Church Hill) ([Barber et al. 1999](#)).
- The Paris Basin Bartonian chert, mined at Jablines ([Bostyn and Lanchon 1992](#)), among others.
- The Cretaceous flint-bearing chalks of the Meuse valley in the southern Netherlands and northern Belgium, including Rijckholt and Spiennes ([Felder et al. 1998](#)).
- Jurassic chert from the right bank of the Rhine, where Kleinkems, the first reported prehistoric flint mine in Germany, was found ([Diethelm 1997](#)); Jurassic flint mined at Abensberg-Arnshofen in Bavaria (papers in [Rind 2003](#); [Roth 2008](#)).

- Polish Jurassic flints from the Holy Cross Mountains: Krzemionki, one of the most famous European flint mines, is associated with the extraction of banded flint (Borkowski 1995); Wierzbica 'Zełe' and Tomaszów (Lech and Lech 1984; Schild 1995) were devoted to obtaining chocolate flint, and Swieciechów to spotted flint.
- Several Neolithic mines have been documented in the Gargano Promontory, on the east coast of Italy. Among them are the Defensola mines, where Eocene nodular flint of excellent quality was extracted (Galiberti 2005).

Although the flint from these regions is well known and often mentioned in the archaeological literature, accurate flint sourcing is somewhat problematic. Most of these different types of flint have been described macroscopically, and some have been a focus of petrographic and geochemical analyses. In any case, it is by no means easy to determine the place of origin of any particular piece of flint. Objects of worked flint can generally be traced back to broad regions or general geological formations, but usually not to specific locations within them (Bostyn and Lanchon 1992, 40; Felder et al. 1998, 16). This fact poses an important problem for research on prehistoric procurement strategies in general, and on the distribution and circulation of mined products in particular.

Raw material availability and quality must have played an important role in the technological organization and mobility patterns of prehistoric groups. Regions without flint could have obtained it through exchange networks, as for example happened in the Hungarian Plain (Biró 1998), but it seems likely that most Neolithic communities relied on the available local stone sources for their everyday needs, whether flint or not. In fact, many other sources of useful stone could be found across Europe, including quartz, quartzite, obsidian, eclogite, jadeite, and dolerite (Duke and Steele 2010), some of which were of particular importance for Neolithic axehead production (e.g. Thirault 2005).

Mining was never the most widespread prehistoric procurement method. Acquiring flint from exposed outcrops and secondary deposits was almost the only strategy used during the Palaeolithic and Mesolithic, and continued to be the most common throughout the Neolithic and beyond. Even in regions where mining was practised, simple collection from surface exposures or from gravels was also carried out. Furthermore, not all known flint sources were mined (Barber et al. 1999, 26; Felder et al. 1998, 5; Field 2006, 81), and those that were were not always located where the best quality flint could be found (see for example Barber et al. 1999, 24).

In many cases flint could have been obtained more easily without digging mineshafts, yet mining still occurred. Buried seams may have had unique or specially desired properties, such as fewer flaws or

larger nodules, but the specific properties of many mined flint sources seem not to have been too different from other accessible neighbouring sources. Without underestimating the importance of procurement and production techniques, it seems as if certain social factors had a decisive role in triggering mining actions, in some cases ensuring that once mining began, it continued for centuries.

THE TECHNIQUES AND SKILLS OF FLINT MINING

The basic sequence of activity carried out in every mine was frequently the same—digging, extracting the raw material, knapping, and managing the waste. Actual techniques could vary from site to site and, sometimes, from shaft to shaft, especially over time. Each flint mine required particular skills and strategic decision-making depending on the multiple social contexts under which those mines developed. Consequently, the methods and techniques used by Neolithic groups in mining for flint may allow us to approach the ways they deployed their labour, certain aspects of the quality of this labour, and only occasionally its quantity. They also provide clues about the knowledge and know-how that were transmitted through generations.

Mining structures

Whilst opencast quarrying of outcrops and shallow deposits was carried out, perhaps even as the first episodes of extraction at mining sites ([Barber et al. 1999](#), 33), Neolithic flint mines are composed mainly of deep shafts that add considerably to the difficulty and risks involved in the process of raw material acquisition.

Four basic types of mining structures, usually occurring in various combinations, can be distinguished: shafts, pits, galleries, and chambers. Both shafts and pits are vertical structures, the main difference between them being their depth: 3m has been proposed as a way of distinguishing between them ([Barber et al. 1999](#), 34–38), a useful distinction for the sake of clarity even if it has no interpretative value. To a considerable extent, the depth of any digging would have been dependent on the depth of the required flint seam. Occasionally, patterns can be found in some mines, where certain seams were preferred and their flint extensively mined, even though their access required cutting through other previous seams, left unexploited. Seams were worked from both pits and shafts, but the deeper shafts could also be utilized to allow more extensive exploitation of buried seams by excavating galleries or cavities.

Chambers and galleries are horizontal excavations. The former are irregular spaces of varied size which sometimes have pillars—unexcavated columns providing support for the ceiling. Some archaeologists have described this variability by distinguishing between niche, pillar, and chamber mines (Borkowski 1995; Migal 1997). Galleries are generally straight and elongated lateral workings of varying size, usually dug to exploit the desired flint seam or in order to facilitate movement between areas of extraction. They may spring from shafts, either at their base or wherever a suitable flint seam was encountered, and in the process they may connect chambers and shafts.

Although Neolithic mining structures across Europe can be made to fit into these four basic categories, or combinations of them, there is wide variety in both size and shape. The diameter of shafts can range from around 1m, as is the case at mines such as Arnhofen and Casa Montero (papers in Rind 2003; Capote et al. 2008) (Fig. 26.2), to as much as 12m at Grime's Graves (Longworth and Varndell 1996). The depth of pits or shafts can range from 1.5 m to 16m, and may be determined not solely by the accessibility of flint seams but by the depth of the desired seam, as sometimes more accessible seams were ignored in order to exploit specific deeper ones. At Jablines the upper layer of flint was only marginally exploited due to its bad quality and mining took place mainly to exploit the inferior layer (Bostyn and Lanchon 1992, 133–134). In Camp-à-Cayaux, part of the mining complex of Spiennes, up to 15 flint layers were passed and ignored in order to access the flint seam the miners were seeking (Collet et al. 2008, 54).



FIG. 26.2. Excavating a deep ‘chimney’ shaft at the early Neolithic flint mine of Casa Montero (Spain). These shafts have an average diameter of little more than a metre and are up to 9m deep. There is barely enough space for a single person. Picture courtesy of the Casa Montero Project, CSIC.

Some galleries are big enough to allow a miner to stand upright, such as those at Petit-Spiennes ([Collet et al. 2006](#), 68) ([Fig. 26.3](#)), whilst others can only be crawled through, such as some of those at Krzemionki, Defensola, or all of the known galleries at Rijckholt ([Borkowski 1995](#); [Felder et al. 1998](#)). This variability can be associated with the different geological conditions at each mine, the technical decisions of the miners, and the size of the labour force involved in the digging process on each occasion. The geological context determines not only the disposition, depth, and size of flint seams, but also the hardness of the deposits being dug into and their relative stability or tendency to collapse. At Krzemionki, for example, four different types of extraction structures were devoted to the exploitation of the sloping layers of banded flint, at different depths and excavating different geological deposits ([Borkowski 1995](#), 65–77).



FIG. 26.3. Extraction galleries from deep shafts at Camp-à-Cayaux in the mining complex of Spiennes (Belgium). These galleries range from 80cm to 1m high. Picture by Guy Focant, courtesy of the Public Service of Wallonia.

The number of persons working per mining structure would have depended on its size: narrow shafts such as those documented at the Spanish mine of Casa Montero allowed for only one person inside digging and extracting the raw material, whilst others could help from outside, hauling waste and flint, and handing the required tools ([Capote et al. 2008](#)). In the case of wider shafts such as those at Grime's Graves, or of wide galleries such as in Petit-Spiennes, several miners would have been able to work within a single structure.

Mining kits

Since tasks performed at every mine were basically the same, consisting of excavation, flint nodule fragmentation, extraction, and waste disposal, mining toolkits frequently comprise a set of similar elements: excavation tools such as picks, sediment- and waste-removing tools such as spades or shovels, and flint-fracturing and extraction tools such as mallets, hammers, chisels, wedges, and levers. The main differences between European Neolithic flint mining toolkits relate both to the specific geological and environmental settings, and the particular cultural practices of each community. This resulted in different raw materials, morphologies, sizes, standardization, and time invested in tool manufacture. In some cases, mining tools appear

rather expedient, requiring little or no preparation prior to use, whilst others were more sophisticated.

Most mining tools recovered to date are made from either bone or stone. Antler picks and levers have been documented at many mines, such as Krzemionki, Jablines, or Grime's Graves ([Borkowski et al. 1991](#); [Bostyn and Lanchon 1992](#), 102–120; [Clutton-Brock 1984](#)). Stone implements like picks, hammerstones, or mallets are also abundant ([Felder et al. 1998](#), 43–48; [Galiberti 2005](#), 129–140; [Collett et al. 2006](#), 69; [2008](#), 60–62), whilst the use of stone axes has been occasionally documented ([Barber et al. 1999](#), 66). Many of these tools occasionally left marks on shafts and galleries (e.g. [Bostyn and Lanchon 1992](#); [Felder et al. 1998](#), 57–60; [Barber et al. 1999](#), 66; [Capote et al. 2008](#)). Other implements made of perishable materials must have been used in mining activities but have left few or no traces. Ropes and baskets served to haul sediment and raw material from shafts, as evidence from Rijckholt suggests, where rope marks at shaft openings have been documented ([Felder et al. 1998](#), 25–43). Wood was most probably used for digging sticks and hafting tools, whilst shovels may well have been made out of the same material.

Organization and planning

Flint mining complexes across Europe represent the product of numerous mining events over time. During each one of them a number of structures were dug and work was organized in a certain way, with a specific degree of planning and a precise number of persons involved. Current interpretations of European flint mines tend to agree on the fact that mining was not practised in an ad hoc manner. Miners must have planned the procurement of tools in advance. Some scholars have estimated that around 400 antlers would have been necessary to dig just a single shaft at Grime's Graves, whilst antlers had to be selected ahead of time, the majority of them cast from living rather than dead animals ([Clutton-Brock 1984](#), 15–16). In other extensively excavated mines, such as Rijckholt, more than 14,000 picks and fragments made of local flint were recovered, occasionally hoarded inside the galleries ([Felder et al. 1998](#), 47). All this evidence suggests that the considerable investment involved in the procurement and maintenance of mining tools must be taken into account when evaluating labour costs at each mining event.

Structures were dug at carefully selected spots, reflecting a general plan and knowledge of the location of previous workings, including those under the ground. Work was carried out with certain know-how, presumably acquired through experience and transmitted through practice from one generation to the next. Digging and extraction

methods and other measures tended to follow similar patterns at every event, except for logical adaptations to differing geological circumstances and the disposition, quantity, and quality of flint seams.

One of the main aspects that had to be planned for and carefully managed throughout the mining process was waste disposal. Digging, flint extraction, and flint knapping generated vast amounts of residues which had to be dealt with. This waste could be arranged around shafts, forming spoil heaps, but it was also commonly used to refill shafts and galleries. This practice was probably aimed not just at removing material that might interfere with future mining and working, but also helped ensure against potential safety threats such as the risk of a shaft falling in, or of a collapse of roofs and walls. Such a system has been documented at Krzemionki, where abandoned spaces were filled with waste derived from newly opened excavations in the chalk (Migal 1997). More sophisticated systems have also been documented, as at Defensola, where miners built limestone walls to contain mining debris and to ease circulation in corridors and chambers (Tarantini 2005).

Ascertaining the number of people likely to have been involved in each mining event relies on the recognition of contemporaneous shafts, pits, or galleries. Although the quantity, size, and complexity of the mining structures can offer some information as to how Neolithic miners organized their labour, the lack of stratigraphic relationships between shafts and the difficulties of refitting massive amounts of stone fragments defy the possibility of identifying individual mining events.

Final products

Neolithic groups mined for flint in order to produce certain tools. Most mines aimed at the production of one principal item—most often axe rough-outs or blades—although others were also manufactured. For example, apart from the major production of axe roughouts, Jablines' miners produced flakes and blades (Bostyn and Lanchon 1992, 184), whilst at Grime's Graves axes, adzes, discoidal bifacial knives, flakes, and blades were produced (Lech and Longworth 2006, 419). Most stages of the lithic operative chain took place predominantly at the mine. Although some chipping floors have been identified on the surface of mining sites (e.g. Felder et al. 1998, 9; Lech and Longworth 2006), knapping activities are most frequently documented through the debris commonly found among the infills of pits, shafts, chambers, and galleries. Estimates of processed and abandoned flint are certainly impressive, such as the 15,000 tons calculated for Rijckholt (Felder et al. 1998, 68). Nonetheless, in most

cases the final stages of production would take place elsewhere, either at settlements (Balcer 2002; Allard 2005) or at workshops located in the vicinity of mines (Lech 2008). These objects could then be used or circulated over relatively short distances, or up to 500km away, as suggested for Volhynian flint from the Ukraine or banded flint from Krzemionki (Lech 1997).

THE TIMES AND SCALES OF MINING

Although some scattered Palaeolithic and Mesolithic quarrying activities have been reported in Europe (e.g. Negrino et al. 2006; Oliva 2011), extensive flint mining seems to be a Neolithic phenomenon. At a continental scale, and judging from the concentration of radiocarbon dates, the peak of mining activities occurred during the fourth millennium BC. Nevertheless, some of the best-known and best-explored mines, such as Grime's Graves (Longworth and Varndell 1996), or some of the most spectacular and recognizable products circulating in western Europe such as the long blades of the French Grand Pressigny region (Mallet et al. 2004), are mainly dated to the third millennium BC.

Mining for flint, as with any other kind of mining, required the excavation and relocation of soil, most clearly visible today in the characteristic 'lunar' topography of the better-preserved mines such as those from the United Kingdom (Barber et al. 1999; Saville 2005) (Fig. 26.4). Seams were most frequently accessed through individual pits, so direct stratigraphic relationships between neighbouring pits are generally absent where the surface traces are less well preserved. Mining also seems to have been an activity that was frequently spatially detached from everyday life, so that organic refuse such as bones or seeds are rarely encountered in excavations, and when present are not necessarily related to mining events. Consequently, there are problems in both establishing a detailed absolute chronology for mines and in building relative sequences. In most cases, organic residues are scarce, and unidentified long-life samples such as wood charcoal are among the most commonly dated remains. Antler picks, as for instance those dated for Grime's Graves or Rijckholt, are rare in many other mines (e.g. Bostyn and Lanchon 1992), and, when present, not necessarily preserved well enough for dating (e.g. lack of collagen). The problem increases when we take into account the selection of dated samples: many of the published radiocarbon dates are single samples rather than series of dates; they often lack detailed contextual descriptions; and where obtained from deep mine shafts, they do not necessarily reflect the complete time-span of the mining

activities at a particular site.



FIG. 26.4. Bird's-eye view, taken from the east, of the monumental 'lunar' landscape at the English flint mine of Grime's Graves. Picture taken 15 May 2004, courtesy of Peter Topping.

Put simply, there are serious limitations for both assessing the intra-site chronological span of mining activity and establishing cross-regional chronological comparisons. These limitations are critical when evaluating both the size of work teams and the amount of final product that may have circulated at any time. That said, the evidence from some of the mines with a larger series of radiocarbon dates—such as Grime's Graves, Jablines, Krzemionki, or Wierzbica 'Zełe'—suggests that mining events were repeated through time, at some sites extending over two millennia. The size of some of the larger mining complexes, like the massive 79 hectares of mining at Krzemionki, would not be the result of an enormous mobilization of labour, but the long-term product of recurrent mining events through the centuries.

There is agreement that mining events may have followed some kind of seasonal pattern. Although the European climatic gradient should be taken into account when assuming that all miners would have chosen a similar season, the potential dangers of deep mining, such as unstable soil, would suggest milder weather as the best. Beyond that, possible information on the seasonality of flint mining events—such as slaughter patterns, migratory fauna, or pollen—has thus far only started to be systematically analysed ([Topping 2011](#)).

All this does not say much about the labour involved or the

chronological interval between each mining episode. This is partly why most archaeologists have been cautious when calculating the amount of labour committed, most frequently suggesting small-scale reiterative actions. This parsimonious hypothesis assumes practical motivations for mining, where the everyday needs for flint fuelled reiterative ‘domestic’ visits to source procurement areas. Yet certain evidence suggests that not all mining events were of such a scale, and that some most likely involved multiple groups temporarily aggregated for larger mining actions.

The radiocarbon dates from some sites hint at the size and possible amounts of time invested in at least some individual mining events. At Rijckholt ([Felder et al. 1998](#)), the excavated area covers 1526sq. m., from which prehistoric miners dug more than 60,000 cubic metres of chalk in order to extract flint nodules. Five radiocarbon dates were obtained—four from charcoal and one from deer antler—all from different parts of the galleries and distributed across a linear distance of over 60m. The fact that all five dates are statistically indistinguishable, and that the samples were randomly selected from those available, suggests they may well be dating the same mining episodes, or ones that were close in time. Equally, the set of radiocarbon dates obtained at the early Neolithic mine of Casa Montero points at the possibility that more than 4000 pits were excavated within just a few generations ([Díaz-del-Río and Consuegra 2011](#)). Similar patterns may be behind the radiocarbon dates of other mines such as Jablines, Ri, or Defensola. The future use of Bayesian modelling will inevitably transform the way scholars perceive Neolithic mining, from considering hundreds of years of small-scale extractions to sets of short-term highly active generational mining episodes.

BEYOND PRACTICAL REASONS

Moving beyond the immediate evidence recoverable from the mines themselves, there are, as already noted, real difficulties involved in placing flint mines within their immediate social, economic, and ideological context. In many cases, we must rely on radiocarbon dating not just for a general chronological framework but to contextualize them in their variable contemporary cultural settings.

This lack of broader evidence also presents problems for understanding whether relatively local populations or aggregations of both local and distant groups carried out the mining. As for the miners themselves, it is commonly assumed they were adult males, although firm evidence is elusive. The small size of some pits, galleries, and

chambers might imply the involvement of adolescents, perhaps children. Considering Neolithic life expectancy, adolescents must have had exposure to the complex set of decision making required to obtain and sort stone, as much as learning through practice the skills to manufacture stone tools. Thus, apprenticeship processes must have taken place during many mining events, and should in fact be part of the archaeological record of flint mines. Complementarily, the presence of females performing different roles during quarrying expeditions is attested in the ethnographic record (e.g. [Arthur 2010](#); [Flood 1999](#), 271; [Herbert 1998](#)), whilst the archaeological record has left little—but noteworthy—direct evidence of their involvement in mining expeditions, such as the Neolithic female burial at Cissbury ([Barber et al. 1999](#), 62). Labouring at flint mines may well have been a gathering of all genders and ages performing different activities. In doing so, they learned and transmitted the knowledge and skills that would shape their identities, both as miners and as members of society.

This sense of mining as a *total social event*, linking the production and reproduction of Neolithic groups, would also clarify why mining itself was not purely and simply a matter of recovering good-quality raw material for tool and weapon manufacture. There are sound practical reasons, of course—buried flint seams would have been protected from the extremes of temperature, and may contain fewer flaws than shallower or exposed deposits—but adequate supplies of flint were obtained during the Palaeolithic and Mesolithic mostly without mines ([Field 2011](#)), and plenty of flint continued to be obtained throughout the Neolithic and beyond without mining. Indeed, many flint-bearing regions across Europe appear to have seen no need for the digging of deep shafts or pits to obtain this raw material.

In fact, it is not uncommon for mines to be located over good-quality flint, but not always the best quality available. In other cases, many other procurement alternatives would have fitted the requirements to produce certain tools. All this suggests that not only the social action but its actual setting was of certain importance to Neolithic groups. The location of mines may have been as important as the raw material recovered from them. This could be the case for some southern English mines, such as those on the South Downs, which enjoyed prominent locations in the landscape and extensive views of the surrounding landscape in some, but not all, directions, and were consequently visible from some distance ([Barber et al. 1999](#)). There are clear similarities here with some of the non-flint stone sources exploited during the Neolithic, which often saw a preference for higher, more difficult to reach exposures rather than

more accessible raw material of equal or better quality (Pétrequin et al. 2006).

Thus the gathering, the setting, and the labour invested in deep mining, combined with the additional element of danger, might have considerably increased the social value of products manufactured using mined flint, as opposed to flint recovered from more mundane, more easily accessible deposits. Considering only a few sources produce flint with outstanding aesthetic qualities (e.g. Polish banded flint), it is not unreasonable to suggest that the origin of the raw material may have been transmitted orally as flint products changed hands.

The flint mine earthworks represent the first monumental horizon of Neolithic Europe. Labouring for flint through deep mining both incorporated and transformed Neolithic groups in different places and at different times throughout the Continent. Behind the practicality of tool production was a set of historically dependent social values that made the deployment and enactment of social labour worth the effort.

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CHAPTER 27

STONE AND FLINT AXES IN NEOLITHIC EUROPE*

GABRIEL COONEY

INTRODUCTION—AXES TO GRIND

GIVEN their sheer numbers, ubiquity, and variability across Europe, stone and flint axeheads are a rich source of information about Neolithic life and society. Axes are frequently regarded as emblematic of the Neolithic and formed part of the original formulation of what constituted the period's distinctive material (e.g. [Childe 1925](#)). Stone axeheads are also used by societies in many parts of the world and European Neolithic axes are often interpreted by analogy with their use in other societies (e.g. [Clark 1965](#); [Pétrequin and Pétrequin 1993, 2011](#); [Brumm 2011](#)).

In parts of Europe such as Scandinavia and Ireland ([Blankholm 2008](#); [Woodman et al. 1999](#)) stone axeheads were used since the Mesolithic, although significant changes in patterns of source exploitation, use, and distribution appear at the Mesolithic/Neolithic transition (e.g. [Cooney 2008](#)). In other areas, the use of stone axeheads correlates with the beginning of the Neolithic (e.g. [Bayliss et al. 2011](#), 779–800). Copper axeheads occur in Neolithic societies in central and south-east Europe from the fifth millennium BC ([Whittle 1996](#), 116–20; [Klassen 2004](#)), but stone axeheads continued in use in some areas well until the Bronze Age. The term ‘axe’ normally refers to the axe blade (or head); wooden, antler, or composite handles survive much more rarely (e.g. [Sheridan et al. 1992](#); [Stöckli et al. 1995](#); [Maigrot 2011](#)). The term also covers what are in fact a number of related morphological forms: axes, adzes, chisels, and wedges.

Frequently the stone outcrop(s) from which axeheads originated can be pinpointed and in some cases the actual quarry sites can be identified. This integration of archaeological and petrological approaches has a long history in some parts of Europe. In recent years, the foundational technique of implement petrology has been complemented by a variety of others, refining our knowledge of

source use and axehead distribution (e.g. [Davis 1997](#)). Given the number and morphological variety of axeheads, long-established typological approaches continue to be an important aspect of stone axe studies both at regional and supraregional level (e.g. [Zalai-Gaál 2001](#); [Pétrequin et al. 2011](#)).

[Clark \(1965\)](#) presciently discussed the significance of the enduring presence of axeheads across human generations, as well as the way in which the surface appearance of the axehead reflects the time and craft invested in it. Recognition that material culture plays an active role in cultural identity has prompted reflection on the wider role of stone axeheads. The symbolic value of the axe is demonstrated by its occurrence as a motif in Breton megalithic art ([Shee-Twohig 1981](#)) and the placement of axeheads in symbolically laden contexts; for example in individual male burials, in LBK cemeteries (e.g. [Nieszery 1995](#)), in features in enclosures (e.g. [Andersen 1997](#)), or as groups formally deposited in a hoard, as in TRB axe hoards ([Midgley 1992](#), 281–284).

Stone axe studies, then, are marked by a range of complementary approaches: those that could be regarded as traditional, science-based approaches (e.g. [Davis 1985](#); [Kars et al. 1991](#); [Cooney and Mandal 1998](#)); those focusing on the materiality and symbolic value of the axe ([Cooney 2002](#); [Skeates 2002](#)); and biographical and contextual approaches ([Edmonds 1995](#); [Skeates 1995](#); [Wentink et al. 2011](#)). Through these approaches both the materials used and the materiality of the axe as a form and object can be engaged with ([Ingold 2007](#); [O'Connor and Cooney 2010](#)). Here, a broadly biographical approach is taken, following the objects through the socially defined life-stages of production, circulation, and consumption ([Kopytoff 1986](#)), considering in turn the lithic sources used, the extraction, quarrying, and working of stone, the use life of axes, and patterns of deposition and discard which returned them to the earth.

BACK TO THE SOURCE

Macroscopic surface identification of the lithologies from which axeheads are made is very useful where sources are visually distinctive. In the case of Polish flint sources, striped or banded Krzemionki flint, grey, white-dotted Święciechów flint, and ‘chocolate’ Volhynian flint can all be readily identified (e.g. [Balcer 2002](#)). In Great Britain, petrographic analysis (microscopic study of rock in thin section) has been carried out since the 1930s. Pioneering work by Keiller, Piggott, and Wallis ([Keiller et al. 1941](#)) led to the establishment of the Implement Petrology Committee (Council for

British Archaeology; Clough and Cummins 1979, 1988), and eventually the Implement Petrology Group (Davis 1997; Davis and Edmonds 2011). This leading programme, together with work in Brittany (Cogné and Giot 1952; Le Roux 1990), acted as the model for the wider application across Europe of the petrological analysis of stone axeheads. Optical microscopy remains the basic scientific technique, now complemented by sophisticated geochemical and isotopic approaches.

Examples of combined petrographic and geochemical analyses include the work of Christensen et al. (2006), who used elemental and Sr, Pb isotopic methods to show that a homogeneous actinolite-hornblende schist rock type (AHS) was the major source of the metamorphic amphibolites widely used in the early and middle Neolithic across what is now Germany. This could be reasonably matched to a single outcrop at Jistebsko in the Czech Republic where there are traces of prehistoric extraction, up to 600km east of the find locations of the axes (see Ramming 2007, 230–40; 2009). Lillios (1997) found the two potential source regions for the amphibolite axeheads from Copper Age hilltop settlements in lowland Portugal to be geochemically distinctive, with all the artefacts in the sample analysed from the settlements being similar to the source in the Alentejo to the east and south-east. Davis et al. (2009) combined petrology, geochemical portable X-ray fluorescence (PXRF), and geochemical inductively coupled plasma-atomic spectroscopy (ICP) to establish a signature for gabbroic prehistoric stone implements from northern England, securely linking some objects to particular outcrops.

Implement petrology work in Great Britain has concentrated on identifying major sources or Groups. The most important sources for axes in England are the volcanic tuffs from Great Langdale in the north-west, known as Group VI (see Fell and Davis 1988; Bradley and Edmonds 1993). Other important Groups are Group VII (augite granophyre) from Graiglwyd at Penmaenmawr in north Wales (Darvill 1989; Williams et al. 1998; Williams et al. 2011) and Group I (uralitized gabbro) from Cornwall (Markham 2009; Floyd 2009). In the Mediterranean regions of Iberia six main lithological groups have been identified based on general rock classification (Risch 2011 with references).

The Irish Stone Axe Project (ISAP) (Cooney and Mandal 1998; Cooney et al. 2011) has provided a comprehensive overview of all stone axeheads with a provenance on the island of Ireland, incorporating archaeological and petrological data. Over 20,000 axeheads are currently recorded on the database, with over 17,000 identified macroscopically as the basis for a programme of

petrographic and geochemical analysis. This has established, for example, that the two sources for porcellanite (a metamorphic rock) in north-east Ireland, known as Group IX in the UK scheme (see [Sheridan 1986](#); [Sheridan et al. 1992](#)) can be separated geochemically ([Mandal et al. 1997](#); [Meighan et al. 1993](#)). Alongside this dominant source a wide range of lithological sources was used, spanning sedimentary, igneous, and metamorphic rocks ([Cooney and Mandal 1998](#), fig 4.1). This systematic approach has also led to the evaluation of the use of particular sources, such as gabbros ([Mandal 1997](#)), and identification of a quarry site on Lambay Island off the east coast of Ireland, where porphyry (porphyritic andesite) was extracted for axehead production ([Cooney 2005](#); Fig 27.1a and 27.1b).



Fig. 27.1a. Porphyritic andesite from Lambay, Ireland, sample of outcrop and small polished axehead from the Eagle's Nest quarry site.

(Photograph: Gabriel Cooney).



Fig. 27.1b. Eagle's Nest, Lambay, Excavation of quarry site; the quarried face to the left of the photograph with a propped anvil stone in front of it.

(Photograph: Gabriel Cooney).

Looking more widely across Europe, the dominance of a major source and/or the use of a variety of sources are common. For example, in Greece microcrystalline igneous and metamorphic rocks were the most widely used ([Moundrea-Agrafioti 1996](#); [Perlès 2001](#), 232). A petrographic and archaeological assessment of prehistoric stone artefacts in northern Italy revealed a raw material circulation network involving the whole region ([D'Amico and Starnini 2006](#)). At a broader level, [Risch \(2011\)](#) has identified patterns in the social and economic organization of stone axehead production and distribution in the western Mediterranean suggesting a reliance for the most part on easily accessible local resources (mostly from secondary sources) and the presence of axeheads from different distant sources. Five major sources were exploited in Brittany, with the dolerite (metadolerite Type A) from Sélédin, Plussulien accounting for about 50% of all axes in Brittany ([Le Roux 1999](#)). Recent work has demonstrated how focused research can both reveal new sources and quarries ([Kerdival et al. 2011](#); dolerite, north-west Mayenne) and change our understanding of the use and extent of circulation of axeheads from particular sources ([Pailler 2010](#); fibrolite, north-west Finistère).

The sources used generally reflect local geology, but there is also the common occurrence of axeheads from distant sources, which may be regarded as imported or exotic. Thus, in the Maltese islands from

the sixth to the second millennium BC, stone axes were both locally produced and imported from Sicily ([Skeates 2002](#)). A functionalist view would suggest that the choice of sources was guided by seeking rocks with suitable mechanical properties for manufacture and use, but other factors were also at play (e.g. [Bradley et al. 1992](#); [Pétrequin 1993](#)). One literally obvious example was the significance of colour. Major sources used in different regions tend to be visually distinctive, most notably the green jadeitite, eclogite, and omphacitite axeheads from Alpine sources that are very widespread across western Europe, but also major axehead sources in Ireland and Britain (e.g. [Cooney 2002](#)). On the Channel Islands, the axes brought from the mainland belonged to visually quite distinctive sources ([Patton 1991a](#), 39). Distinctive white/yellow speckles are a feature of a number of the Irish axe sources, and it has been suggested ([Cooney 1998](#), 117–8) that this might symbolize an ancestral presence. The same speckled effect occurs for example in thin butted porphyritic axeheads from central Sweden ([Welinder and Griffin 1984](#)), diabase adzeheads from Stakaneset on the Norwegian coast ([Olsen and Alsaker 1984](#)), and amphibolite axeheads in western Iberia ([Fig. 27.2a](#); [27.2b](#), [Lillios 1997](#)).

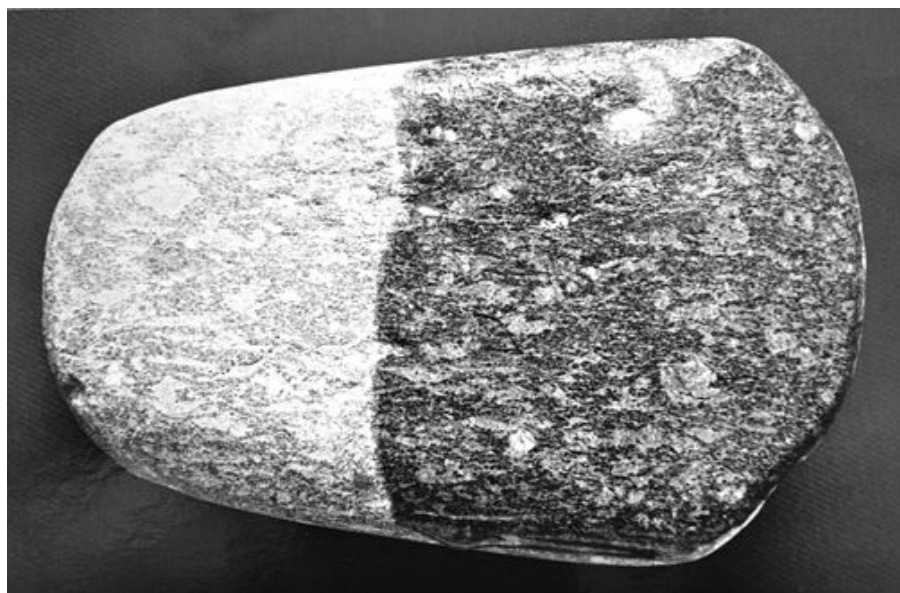


Fig. 27.2a. Amphibolite axe from Zambujal, Portugal.

(Photograph: Katina Lillios).



Fig. 27.2b. Plaque from Olival da Pega (Évora, Portugal).

(Photograph: Katina Lillios, courtesy of Museu Nacional de Arqueologia).

QUARRYING AND EXTRACTION, THE POWER OF PLACE

The rock to make stone axeheads was obtained either from primary outcrops or from secondary sources such as cobbles from rivers, beaches, or glacial deposits (e.g. [David and Williams 1995](#), 454–5; [Briggs 2009](#); [Risch and Martinez Fernandez 2008](#)). The morphology of the object frequently reflects its origin from a secondary source. From a prospecting point of view, the context of such cobbles and their naturally polished surfaces could have been a guide to the location of primary outcrops and an indicator of the visual appearance of the axehead after polishing. There are three main forms of initial shaping and processing to bring the stone to a rough-out or preform stage. Flaking is a characteristic of fine-grained, homogeneous material which, like flint, can take a predictable conchoidal fracture. Pecking/

hammering is used with coarser-grained igneous and metamorphic lithologies (Coope 1979). Experimental work has demonstrated that pecking is slower than flaking (e.g. Dickson 1981, 36), but coarser-grained rock types do not flake in a predictable manner, excluding rapid reduction by flaking. Cleaving or sawing can also be a primary treatment, for example with fibrolite in Brittany and Alpine jades (Pailler 2010, fig. 11.6; Croutsch 2005). In reality, we sometimes see the combined use of these treatments, for example with jadeitites, omphacitites, and eclogites (Pétrequin et al. 2006, 2008a).

General differences between the results of flaking or pecking/hammering have a very significant impact on our ability to identify quarry sites. Where flaking was the major primary treatment, stone extraction leaves distinctive scars and fractures on the rock surface and the steps in the reduction process or *chaîne opératoire* can be followed through the predictable occurrence of different forms of debitage, resulting in sites with large-scale, highly visible, and sequential evidence of extraction and working, which have dominated our perception of Neolithic quarrying (Coope 1979, 99). This includes flint mines (Allard et al. 2008), such as Grime's Graves in south-east England (Barber et al. 1999), Rijckholt in the Netherlands (de Grooth 2005), Spiennes in Belgium (Collet et al. 2008), and Krzemianki in Poland (e.g. Babel 2008), as well as quarries such as Great Langdale in north-west England, where a distinctive volcanic tuff was worked (Bradley and Edmonds 1993). Traces on rock faces and debitage are more difficult to discover and interpret where pecking and hammering were the main primary treatment, as at Stakaneset, Norway (Olsen and Alsaker 1984; Bergsvik 2006, 123–24) and Lambay (Cooney 2005).

Stone axe quarries are located in areas with rock outcrops, flint mines where there are chalk deposits (e.g. Körlin and Weisgerber 2006). Traditionally, these sites have been termed 'industrial' and viewed, both in terms of location and function, as peripheral to the main focus of Neolithic settlement and society. However, axeheads often circulated over 150km from their sources (e.g. Pétrequin 1993; Whittle 2003, 45–47), in the case of the AHS axes in LBK contexts up to 600km, and in the case of jadeite axes over 1000km (Pétrequin et al. 2008b). Allied to the visual distinctiveness of many of these sources, this has led to the recognition of the key, active role of axeheads and their places of procurement. Rock would have had a particular symbolism drawn from its link to the ancestral power of the land, redolent with potency and danger (Whittle 1995). Given the physical and metaphysical danger in working and disturbing rock surfaces (Taçon 1991, 203–204), production activities were most probably guided by ritual as well as craft tradition, with activities

taking place in prescribed ways. Axeheads from particular sources frequently have a morphological signature. In Scania, south Scandinavia, axeheads from flint mines retained a small area of cortex to show that they had come from underground sources ([Rudebeck 1998](#), 326). Along with colour, the form of the axe connected it to its place of origin in the landscape. As objects were used and exchanged, they gathered meanings and their genealogy may have included stories of their origin. Their colour and appearance marked them as distinctive from locally available axeheads ([Ballard 1994](#); [Cooney 2002](#)).

Their sometimes spectacular locations also contributed to making axe quarries special places. These include mountains, at the extreme the Alpine jadeitite quarries on Mont Viso (Piedmont, Italy) at 2,000–2,400m altitude ([Pétrequin et al. 2006, 2009](#)), but also sites like Great Langdale (tuff) in north-west England, Killin (calc-silicate hornfels) in Scotland, and Tievebulliagh in north-east Ireland, one of the two porcellanite sources ([Cooney 1998](#)). Quarries for axehead production are also frequently located on islands, as seen along the Atlantic façade from Bømlo/Hespriholmen (rhyolite) on the west coast of Norway ([Alsaker 1987](#)) to the riebeckite felsite from Shetland ([Ballin 2011](#)), the red flint from Helgoland in the German Bay ([Beuker 2005](#)), the porcellanite from Brockley on Rathlin Island off north-east Ireland ([Cooney 2000](#), 192–194), the porphyry (porphyritic andesite) from Lambay, off the Irish east coast ([Cooney 2005](#)), and the presence of both locally produced and imported axes on the Channel Islands ([Patton 1991a](#)). Here, axes made from a visually distinctive grey dolerite with rectangular white plagioclase crystals (Type P) appear to come from the spectacular site of Le Pinnacle, Jersey ([Patton 1991a](#), 35–36; [1991b](#)).

Indeed the Channel Islands illustrate several of the patterns discussed above; the visual distinctiveness of axes from particular sources, the spectacular location of some of the quarries, and their occurrence on islands. In an island world such as the Channel Islands, where axes of various visually distinct rocks moved between islands and between islands and the mainland, the value of possessing and circulating such objects in underpinning social relationships may have been accentuated (see [Skeates 2002](#) for relevant discussion regarding Malta).

AXEHEADS AT HAND—THINKING AND WORKING WITH STONE

In interpreting the functions, uses, and roles of axeheads we can draw

on the contexts in which they are found and other evidence for their use, such as the sources they are made from, their size and morphology, tool marks on wood, and wear patterns on axeheads themselves. As this term covers objects functioning as adzes, chisels, and wedges, as well as axes, they would have been used in cutting trees, splitting timber, trimming, carpentry, and a wide range of expedient roles. Axeheads also functioned as weapons. For example, the skulls in the LBK mass grave at Talheim bear the impact of both thin and thick (shoe-last) axeheads (Wahl and König 1987; Guilaine and Zammit 2005, 86–91). The axe may have been strongly associated with male roles and the acquisition of an axehead for use as a tool and weapon may have validated male identity (e.g. Whittle 2003, 39). It seems appropriate, then, to think of axes as powerful material metaphors and metonyms with layers of meaning and symbolism.

Returning to the life of an axehead, the grinding and polishing that transformed a rough-out or preform into a finished axehead frequently took place away from the quarry sites (although there are exceptions; Cooney 2005). In western and northern Europe, there are specialized production workshops where rough-outs or blanks were shaped into specific forms and taken on to settlement sites for polishing and use (e.g. Larsson 2011; Giligny et al. 2011). Production zones may have existed around major sources. For example at the black pelite quartz source at Plancher-les-Mines in the southern Vosges mountains, small-scale exploitation began in the later sixth millennium BC. The first proper quarries date to the later fifth millennium and by 4000 BC settlements concerned with the secondary working of extracted stone existed in a zone 20–55km from the source (Pétrequin and Jeunesse 1995, 66).

In production zones the working of stone into stone axeheads would have become embedded into the life of some Neolithic communities. This contrasts with areas further away where axes from distant sources ended up, often to be used alongside local lithic materials. Whittle (2003, 47) has pointed out that in LBK contexts, axes and adzes tend to be the major lithic material to come from any distance. In southern Italy and Sicily, there is a contrast between locally sourced, less carefully finished granite and basalt axes and small, well-finished, ‘exotic’ greenstone (and jadeitite) axes (Leighton and Dixon 1992). Sometimes the focus appears to be on local, secondary sources. For the early Neolithic in Greece Perlès (2001, 232–233) suggests that most axes were made of suitable river/beach pebbles or cobbles in the context of domestic production. This is borne out by Stroulia’s (2003, 8–9) detailed analysis of axes from Franchti Cave in the north-eastern Peloponnese. By contrast Tsoraki’s (2011) analysis of the Makriyalos site indicates that in northern Greece in the late Neolithic both local

and non-local sources were used.

One of the most commonly used ciphers for interpreting axehead function is their size. [Chappell \(1987\)](#) in her examination of Group VI (tuff) axes in England, divided them into very large (larger than 20cm), large (15–20cm), and small axes (less than 15cm). Of some 4,500 axeheads from Ireland that were measured, over 73% were 8–16cm, 14% over 16cm, and 13% less than 6cm long ([Cooney and Mandal 1998](#), 39; the latter are often referred to as ‘miniature’ axes; other studies have used a length of less than 5cm to define a miniature). These figures are comparable with those for axes from Wales and mid-west England ([Darvill 1989](#), 38–39). Drawing on ethnographic analogy it is often suggested that large, visually distinctive, well-finished axeheads are likely to have carried the most complex social meanings and to have circulated in exchange for other objects and materials to create and underpin individual and communal identities and relationships (e.g. [Weiner 2003](#)). Whilst this can be accepted as a general statement, there were regional and contextual variations. [Perlès \(2001](#), 231–232) points out an important contrast between regions of Europe, particularly in the early Neolithic. In south-east Europe, axeheads are rarer, local sources tend to dominate, and there are few large examples ([Perlès 2001](#), 231–232). In central and north-west Europe they tend to be larger and the production, use, and exchange of stone axeheads are often seen as critical to the articulation of links between communities (e.g. [Cunliffe 2001](#), 206). In a regional case study of Orkney, [Clarke \(2011](#), fig. 9) has shown that whilst no axehead there is longer than 16cm, size did matter, with examples in megalithic tombs and special deposits being longer and more likely to be complete.

The frequent occurrence of broken axeheads on settlement sites suggests their importance as functional objects. Those between 6 and 15cm in length are most likely to have been used for cutting timber and woodworking, as shown by experimental work and the analysis of axehead marks on worked wood (e.g. [O’Sullivan 1996](#)). Miniature axes have been variously discussed as potential fine woodworking tools, toys, or amulets, especially where there is a perforation suggesting that the object was worn around the neck. For the central Mediterranean, [Skeates \(1995\)](#) has argued that miniature greenstone axes were ‘terminal’ commodities, too worn down to be of further practical use, but with a history and origin too highly valued to be thrown away. So they were transformed into valuables and sometimes modified into axe-pendants and amulets, becoming related to particular individuals and in the process perhaps taking on the power of personification. [Bailey \(2005](#), 29–36) has talked about how miniaturizing things can give people a sense of control. In this context,

we can see how an axehead miniature could become a condensed locus of action and social meaning.

Finally, the Projet JADE (see key discussion in [Pétrequin et al. 2008b, 2011](#)) has transformed our understanding of the role and scale of networks of axe movement and exchange during the Neolithic ([Fig. 27.3](#)). From the end of the sixth to the beginning of the third millennium BC, two groups of quarries in Alpine northern Italy were the source of most of the eclogite, omphacitite, and jadeitite axeheads found in Neolithic Europe. The axeheads were very widely distributed in the period 4700–3800 BC and particularly in the centuries from 4500–4300 BC. The focus outside the production zone was on axeheads over 15cm in length. Their distribution shows the extent of the dispersal and exchange systems in the fifth and fourth millennia BC. There are two routes from the Alpine sources, one through the lower Rhône valley, then west and north via the Carcassonne Gap-Garonne-Gironde to the Atlantic and on to the Loire valley and Brittany, corresponding with the general distribution of southern types of Alpine axeheads ([Pétrequin et al. 2008b, fig 22.2, 22.4](#)); the second, corresponding with the northern types of axeheads, leading up the Rhône-Saone valley and then splitting, one branch leading into the Seine valley and the other to the Rhine-Moselle valleys and beyond ([Pétrequin et al. 2008b, fig 22.2, 22.6](#)). [Pétrequin et al. \(2008b, 276\)](#) suggest that the majority of Alpine axeheads in Britain and Ireland came from contacts with the coastal area between Brittany, the Seine valley, and possibly as far north as the Rhine estuary.

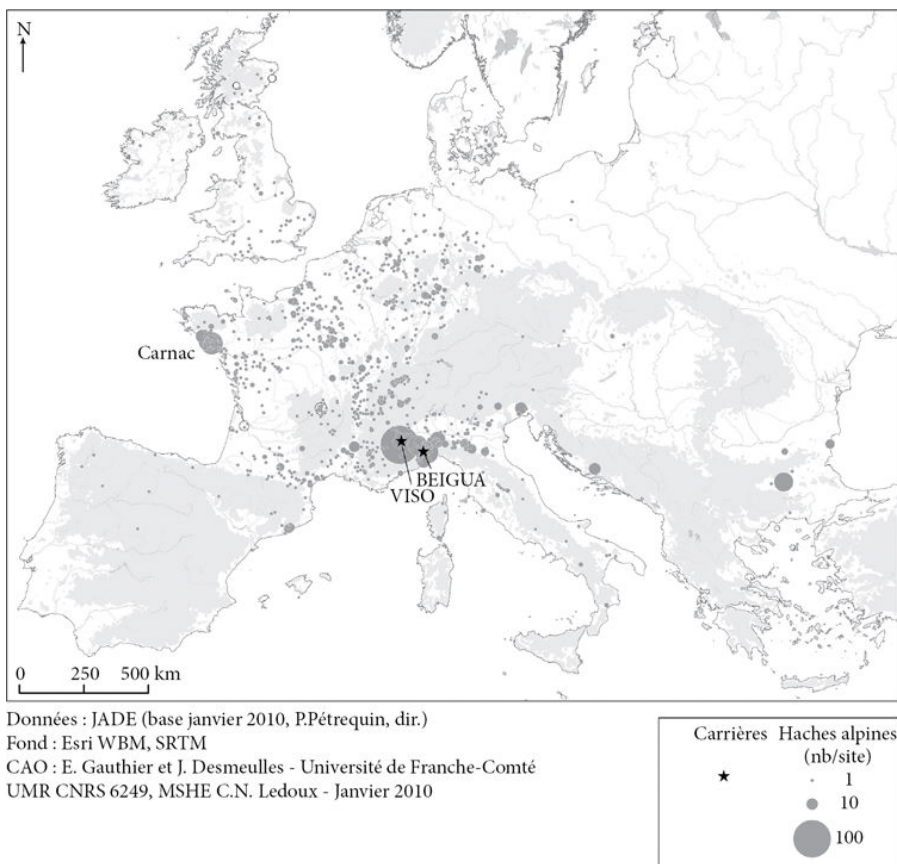


FIG. 27.3. Distribution of large Alpine axeheads.

(Source: Programme JADE; cartography E. Gauthier et J. Desmeulles, documentation P. Pétrequin).

Given the status of these objects as symbolic and sacred, [Pétrequin et al. \(2008b\)](#) argue that they played a key role in the Neolithization process in Ireland and Britain. For [Cooney \(2008\)](#), the use of stone, including the organized quarrying of specific sources for axes, was a critical resource in Neolithic Ireland and western Britain. It is possible that this was at least partly driven by the desire to emulate the power of a stone that had its origins back in time and over 1,700km to the south ([Sheridan 2007](#)).

DEPOSITION—BURYING THE HATCHET

A jadeitite axe was deposited beside the trackway known as the Sweet Track in the Somerset Levels in south-west Britain some time around 3807/3806 BC ¹ ([Coles and Coles 1996](#), 28). As well as providing us

with a date for the deposition of an Alpine axehead, it is a reminder that the life of axes was often deliberately ended by placing them back in the ground. Discussion has tended to focus on axeheads from known archaeological contexts: occupation sites, ceremonial sites, burials, and hoards. This has involved classing most axeheads as 'stray' finds, without any archaeological context. However, a broader understanding of how axes were used and deposited is needed. In Ireland, [Cooney and Mandal \(1998, 34\)](#) were able to present detailed contexts for over 2,000 axes. Over 40% came from river beds, relating both to modern drainage operations and also to the original deposition of axes, particularly at fording places. The concentration of axeheads in rivers has long been noted in Britain, for example in the Thames ([Adkins and Jackson 1978](#)). In Ireland, smaller numbers came from related riverside and lacustrine contexts. Almost 12% came from bogs, at least in some cases as deliberate deposits, and almost 15% from agricultural land, if nothing else indicating the extent of prehistoric, particularly Neolithic, activity across the landscape.

If the axe was a key material expression of social identities and relationships, the focus of this active role varied in different cultural settings and over time. We can examine this variability through the contexts in which axeheads are found: discarded or deposited on occupation sites, placed with the dead, put in ceremonial contexts such as ditches and pits of enclosures. Here, I focus on the deposition of axeheads in hoards. The result of a series of deliberate actions, hoards force us to consider how people thought about axes, and to reflect on their meaning in other contexts. Hoards are part of a wider pattern of deliberate deposition ([Whittle 1988, 124–26](#)) and widespread across north-west Europe (e.g. [Pitts 1996](#); [Cordier and Bocquet 1998](#); [Ebbesen 1993](#); [Rech 1979](#); [Nielsen 1977](#); [Midgley 1992](#); [Karsten 1994](#); [Wentink 2006](#)). In Ireland, the largest hoard comes from Malone, Belfast, with 19 porcellanite axeheads, at least 14 placed with the butt in the ground, the blade facing to the sky. This hoard stands apart because most hoards in Ireland comprise only two or three axeheads. Very large axeheads (over 20cm) are much more frequent in hoards (26% of the total number of axes) compared to their general occurrence in Ireland (4.8% of the total). This can be compared to thin-butted axeheads in southern Scandinavia, where those in hoards tended to be significantly longer than those found on settlements ([Olausson 1983](#)). Thus, axeheads were deliberately chosen for placement in hoards (see [Larsson 2011](#)), and where we have details of their arrangement we can sometimes see a concern with placement itself ([Fig. 27.4](#)).

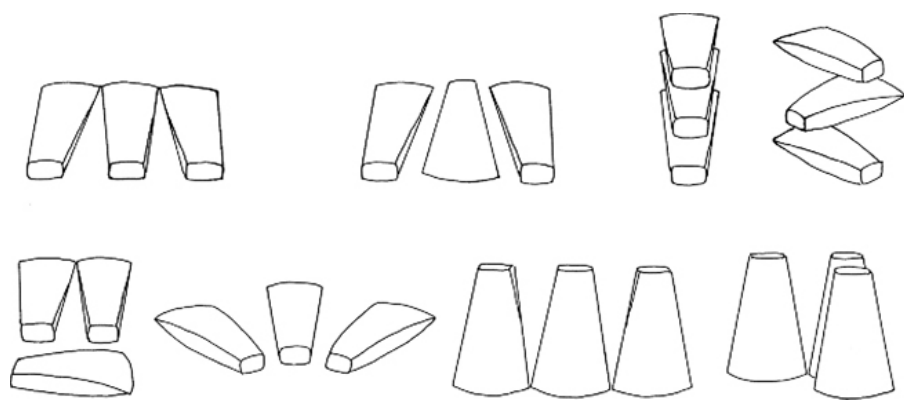


FIG. 27.4. Arrangement of axes in TRB hoards

(after [Reich 1979](#)).

Axeheads carry their histories in their materiality, the stone they are made from, and the narratives that people wove around these mnemonic objects. Through their use and exchange, they extended and bound people together and in this socially active sense had the potential to be part of the future. On the other hand, they also came from the past, hence the production and deposition of axeheads may have been envisaged as linked actions (e.g. [Larsson 2011](#); [Wentink et al. 2011](#)). [Wentink \(2006, 71; 2008\)](#) demonstrated that the axehead hoards of Drenthe in the northern Netherlands consist of large, ceremonial flint axeheads, produced in northern Germany or Denmark, exchanged over significant distances, and deposited in wet locations. From use-wear analysis the axeheads appear to have been wrapped, placed, unwrapped, viewed, re-wrapped, and returned to the ground. So, rather than considering production and deposition as separate, perhaps more importantly they represent the points at which the cycle began again.

In at least some cases axeheads were placed in hoards unhafted, and hence held in the hand. For [Bailey \(2005\)](#), objects depicting or representing the human form, or other animate forms, in miniature could be handled, used in ceremony or the transfer of knowledge, and gave people a sense of control and security. It seems clear that on some occasions axes did stand for people (see [Battaglia 1990](#)). In Thessaly in Greece ([Bailey 2005, 155–156](#)), the most basic figurines are decorated triangular marble axehead-like objects found with the butt stuck into undecorated clay bodies, in place of a head and neck. In western Iberia, there are striking similarities between engraved stone plaques and stone axeheads ([Fig. 27.2a and 27.2b](#)), and both are about the size of a human hand. [Lillios \(2008, 118–119\)](#) suggests that a plaque evoked ‘axeness’ and that the axe was a potent visual metaphor in the Neolithic, with its connotation of taming the land,

being a potential (and real) weapon, and evoking strength and durability.

In this context it becomes easier to understand why big axes were special. Partly, they may have represented the power and prestige of particular individuals or something bigger than a person, something animating ancestral forces or the wider community. Non-local axes from sources far away in time and space, which had the aura of distant, mythological origins rather than a known, short, local history, would be considered particularly significant. Their sheer physical size and appearance would also have made an impression. In the early Neolithic in Carnac in southern Brittany, Alpine axeheads were reshaped, repolished, and moved again, for example across the Bay of Biscay to Galicia (Cassen and Pétrequin 1999; Cassen and Vaquero 2000). The contemporary decorated menhirs in Brittany, some of which bear an axe motif, could themselves be seen as a monumentalization of the axe form (e.g. Whittle 2003; Tilley 2004), an image that brings to mind the deliberate placement of axes in a vertical position in hoards. As Lillios (2008, 19) put it, the axe ‘was a tool essential in the construction of social and cultural personhood. Axes made one human’.

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NOTE

1. Dendrochronological date.

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CHAPTER 28

POTS AND POTTERS IN THE MESOLITHIC–NEOLITHIC TRANSITION IN SOUTH-EAST EUROPE

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INTRODUCTION

POTTERY was once conceptualized by an interpretative triad suggesting that in the context of human social evolution, ‘lower barbarism’ (Neolithic) can be distinguished from ‘upper savagery’ (Mesolithic) by the presence of ceramic vessels (Morgan 1878), that territorial distributions of pottery types reflect ‘sharply defined archaeological cultural provinces’ (Kossinna 1911, 3), and that the invention of ceramic technology and pottery making was ‘the earliest conscious utilization by man of a chemical change ... in the quality of the material ... the conversion of mud or dust into stone’ in the Neolithic (Childe 1951, 76–77).

Decades later, pottery assemblages from the initial European Neolithic settlements were related to genetically identified haplogroups within modern European populations which were believed to be legacies of prehistoric population movements across Europe (cf. Shennan, this volume). Two interpretative paradigms were dominant, one suggesting pioneer or leapfrog colonization, and the other ‘demic’ diffusion and a large Neolithic population replacement. Both are hypothesized to be associated with the spread of the agricultural frontier and painted pottery dispersal from central Anatolia via the Balkans and central Europe towards the Atlantic and Baltic coasts. The presence of pottery associated with hunter-gatherer communities in western Siberia, the Russian Plain, and northern Europe was overlooked by these approaches (cf. Gronenborn and Dolukhanov, this volume; Bartosiewicz and Lillie, this volume). Diverse forms of ceramic technology had been used by hunter-gatherers long before the transition to farming appeared, with ceramic figurines dating back to the Gravettian and Epigravettian complexes in

central Europe, c. 30,000–27,000 BC.¹ In western Siberia pottery was produced and distributed in hunter-gatherers' communities within the time span c. 8300–6400 BC (Zakh 2006, 77), whilst further to the west in the western Urals and middle Volga River, the oldest pottery was contextualized in Elshanka (Yelshanian) small seasonal sites, scattered in a vast forest-steppe area. Vessels with conical and flat bases were made from silty clay tempered with organic matter, fish scales, and crumbled animal bones. They are decorated with imprints of pits, notches, and incised lines. Dates on bone samples and carbonized food residues range between 7070 and 6509 BC (Zaitseva et al. 2009, 799–800, tab. 1; Vybornov et al. 2013). Around the same period, the earliest pottery production in the Near East was embedded in farming social contexts. This painted pottery dates to 7066–6840 BC (Özdoğan 2009; Nieuwenhuys et al. 2010).

Initial pottery distribution in western Eurasia thus shows two almost contemporary but geographically distinct trajectories. The northern is embedded in hunter-gatherer contexts in East European Plain; the southern is associated with the well-developed farming economy in the Near East. The early pottery distribution in south-east Europe has long been suggested to be related to the latter and associated with the massive Near Eastern human immigration and the transition to farming in the region, and this chapter reassesses that conclusion. In south-eastern Europe pottery appeared at c. 6500–6030 BC in different social contexts, whilst in Thessaly it was found in farmers' settlement contexts; in the northern Balkans it appeared in both hunter-gatherer and farming communities.

REGIONAL PATTERNS AND CERAMIC TECHNOLOGY

The composition of the ceramic fabric and the shape and ornamentation of vessels suggest regional patterning in pottery-making techniques. The pottery assemblages in the earliest settlement contexts on the Peloponnese and the most southern tip of the Balkan Peninsula consist of monochrome red slipped pottery (i.e. coated with a clay slip that, when fired, gives the vessel a red surface), and 'a very limited use of painting' (Perlès 2001, 112; see also Krauß 2011, 119) (Fig. 28.1). By contrast, painted vessels were clearly the first to appear in the settlements in northern and eastern Balkans, where painted vessels comprise from 0.2% to just less than 10% of the total quantity of ceramics (Budja 2009, 126; Krauß 2011, 122). Annual pottery production has been estimated at between 12 and 13 pots at Franchthi and 25 to 90 pots at Nea Nikomedeia (Perlès 2001, 214; Pyke and Yiouni 1996, 185). The distributions of ceramic items, such as female

figurines, sometimes exaggerated in form, stamp seals, anthropomorphic, zoomorphic and polypod vessels, which do indeed connect south-east Europe and western Anatolia, supporting the perception of migrating farmers and the gradual distribution of the ‘Near Eastern Neolithic package’ (Lichter 2005; Özdoğan 2008, 2011). Yet it is worth remembering that the beginning of the Neolithic in south-eastern Europe was marked neither by stamp seals nor ceramic female figurines. No single stamp has been found in the Thessalian EN I (c. 6500–6430 BC) and none of the clay figurines can be securely dated to it. Figurines do appear in secure contexts in the EN II (c. 6350–6200 BC) and stamp seals can securely be dated to EN III/MN I in the southern tip of the Balkan Peninsula and on Peloponnesus (Reingruber 2011a, 301; 2011b, 135). When figurines appeared in south-eastern Europe, they remained highly schematized, sometimes to the extent that their identification as anthropomorphic is debatable (Vajsov 1998, 131; Perlès 2001, 257; for a general overview, see Hansen 2007).



FIG. 28.1. The ‘Monochrome’ and painted pottery in the Aegean early Neolithic
(from Theocharis 1973. Plate IV).

The earliest pottery productions are embedded in time spans at c. 6500–6200 BC in the southern Balkans and Peloponnesus, at c. 6440–6028 BC in the northern and eastern Balkans, and at c. 6330–6030 BC in the Adriatic (Perlès 2001; Thissen 2005, 2009; Reingruber and Thissen 2009; Budja 2009, 2010; Reingruber 2011a, b). Whilst pottery in the

southern Balkans was found in farmers' settlement contexts only, it appeared in the northern Balkans in both hunter-gatherers' and farmers' settlements (Perlès 2001; Budja 2009). At Lepenski Vir, for instance, pottery was found within trapezoidal built structures (nos 4, 24, 36, and 54) associated with hunter-gatherers' burial practices including burial of neonates and secondary burial (or deposition) of human and dog mandibles (Budja 1999, 2009; Garašanin and Radovanović 2001; Stefanović and Borić 2008; cf. Borić, this volume).

The pottery assemblages in south-east Europe show local and regional differences in making techniques, vessel shaping (Thissen 2009), and ornamenting (Schubert 1999, 2005). Combined petrographic and chemical compositional analysis of clay and ceramic matrix show clearly indicate differences in pottery productions. Pottery in the northern Balkans was consistently manufactured according to a single recipe, using non-calcareous micaceous clays with a matrix characterized by alluvial, well-sorted, fine quartz sand, with feldspar, and heavily tempered with organic matter (i.e. chaff). In the Adriatic, pottery was heavily tempered with crushed calcite on the eastern coast, and with mineral resources (e.g. flint) and grog (recycled pottery) on the western coast (Spataro 2011). In the Aegean, pottery was from the beginning made locally in a number of sites and exchanged regularly between nearby settlements. Some fine ware paste recipes show that pottery may have been transported a distance of around 200km and that have been part of maritime exchange networks. The unchanging ceramic matrix in some cases reflects significant continuity in pottery technology during the early Neolithic (Tomkins et al. 2004; Quinn et al. 2010).

In general terms, two basic ornamental principles are recognizable in south-east European early Neolithic pottery. In southern parts of the region (Thessaly and Peloponnesus) ornamentation appeared in a red and black colour. Further to the north, in Macedonia, white was added, and in northern and eastern regions of the Balkans white ornamentation dominated in the earliest pottery assemblages. A similar regional pattern is seen in motif distributions, as dots and grids dominate the northern and eastern Balkans, and triangles, squares, zigzags, and floral motifs the southern Balkans and Peloponnesus. A similar regionalization was recognized in the differences of the composition of the plant suites and in the varieties of Neolithic wheat compositions within these areas (Perlès 2001, 62; Colledge et al. 2004; Kreuz et al. 2005; Coward et al. 2008). Whilst painted motifs are limited to the Peloponnesus, the Balkans and the southern Carpathian Basin, cardium-impressed ornamentation marks the pottery of the Adriatic coast. It is not before the middle Neolithic that painted pottery appeared on the eastern Adriatic coast (Müller 1994; Schubert

INTERPRETATIVE PARADIGMS FOR THE ORIGINS AND DISTRIBUTIONS OF SOUTH-EAST EUROPEAN NEOLITHIC POTTERY

The appearance of pottery has long been studied in conjunction with the appearance of new populations. Whilst Neolithic pottery was hypothesized as a universal indicator of both ‘cultural identities’ and ‘distributions of ethnic groups’, early studies focused on the morphological characteristics of Neolithic skeletal remains as indicators of Neolithic population dynamics. [Gordon Childe \(1939, 17\)](#) linked pottery with potters who were ‘early colonists’ or ‘immigrants from South-Western Asia’ who produced ‘unpainted and coarse and chaff-tempered vessels’ on the Balkans and ‘extremely fine burnished and painted ware in the Peloponnese’ ([Childe 1958, 58–60, 86–88](#)). [Carleton Coon \(1939\)](#) introduced a migration model in which the local hunter-gatherers (the ‘Alpines’) failed to survive the ingress of migrating newcomers (the ‘Mediterraneans’). Coon’s migration model was never recognized in archaeology, although the migration of ‘Mediterraneans’, the concept of blending populations, the cultural and population frontiers have remained focal points in interpreting the European Neolithic (e.g. [Pinhasi and von Cramon-Taubadel 2009](#)). More recently, it has been suggested that new strontium isotope data from the Danube Gorges in the northern Balkans indicate the physical ‘differences between populations’ and, a ‘dramatic increase in the numbers of nonlocal, first-generation migrants’ since at Lepenski Vir, as of the sample of 45 individuals, there are five nonlocal individuals associated with the Mesolithic–Neolithic transition phase at 6200–6000 BC ([Borić and Price 2013, 3299, 3301](#)). Four of these five are female and Borić and Price suggest that women moved to the region as part of an ongoing social exchange and population blending in the context of the spread of Neolithic communities through south-eastern Europe along a route from western Anatolia, the Bosphorus, Thrace and along the Black Sea coast into the Danube ([Borić and Price 2013, 3302](#)).

Pottery production has also been proposed as ‘the most obvious diagnostic element’ for tracing ‘waves of migrations’ from Asia Minor ([Schachermeyr 1976, 43–46](#)). In the most influential interpretation in the 1960s, south-eastern Europe was recognized as a ‘western province of the Near Eastern peasant cultures’, created by the processes of colonization and acculturation’ ([Piggott 1965, 49–50](#); see also [Rodden 1965](#)). This assertion was grounded on the identification

of 'common traditions in pottery styles' between the regions and in the distribution of 'oriental stamp-seals' and female figurines, and 'sometimes of animals, which may relate to religious cults'. [Nandris \(1970, 193, 202\)](#) suggested that this dispersal marks early Neolithic 'cultural unity', which was 'greater than was ever subsequently achieved in this area of south-east Europe, down to the present day'. In this context, Greece was suggested as being the location of the 'foundation' and 'construction of the main features of Neolithic culture' in Europe ([Theocharis 1973, 58](#)). 'Monochrome' and painted pottery thus achieved paradigmatic status as cultural and ethnic markers of the Neolithic diaspora, in which farming 'oriental' communities dispersed across the Peloponnese and Thessaly. By the end of the Aegean early Neolithic, the diaspora had supposedly spread to northern regions, and farming communities were established in the Balkans and Carpathian basin. A wave of migrations along the Vardar and Morava rivers, marked by the spread of white and red painted pottery, was hypothesized.

Cultural and ethnic distinctions were based on styles of pottery, and thus changes in cultural or ethnic groups were based on 'typological comparability and comparative stratigraphy' ([Milojčić 1949](#); [Parzinger 1993](#)). Whilst red and white painted pottery was believed to indicate an Anatolian population and culture, coarse pottery was perceived as something so local to the Balkans that 'we do not believe that this primitive pottery was introduced from Asia Minor' ([Theocharis 1967, 173](#); cf. [Thissen 2000, 163](#)). Pottery assemblages with 'impresso' decoration made with fingernail and shell impressions, or by pinching clay between finger and thumb, and 'Barbotine' pottery with the application of a slip in the form of thick patches or trails comprise the most popular types of pottery in the Balkans ([Fig. 28.2](#)). These were explained simply as showing 'a clear regression in pottery production' ([Milojčić 1960, 32](#)). In Thessaly, this pottery was linked to an interruption in the 'painted ware tradition' ([Nandris 1970, 200](#)). [Milojčić-von Zumbusch and Milojčić \(1971, 34, 151\)](#) have suggested the interruption was associated with 'barbarian local production' brought into the region by a migrating population from the north, and marked by 'burnt layers' and settlement destruction in northern Thessaly at the end of the early Neolithic. Meanwhile, it was hypothesized that white painted pottery marked 'a breakthrough' by Anatolian 'ethnic components' and early Neolithic cultures from Thessaly to the northern Balkans and the Carpathian Basin ([Garašanin 1979](#); [Pavlu 1989](#); [Garašanin and Radovanović 2001, 121–122](#)). Differences in decorative motifs and ornamental composition were thought to constitute clusters of cultures in the region: 'Anzabegovo-Vršnik' in the southern Balkans ([Fig. 28.3](#)), 'Starčevo/Körös/Criș' in its

central and northern areas, and ‘Kremikovci’, and ‘Karanovo’ in its eastern parts (Schubert 1999; Krauß 2010). A parallel trajectory towards the Adriatic and the central and western Mediterranean was recognized in distributions of ‘Impresso (Cardial)’ pottery (Fig. 28.4) and associated cultures (Parzinger 1993; Müller 1994).



FIG. 28.2. The ‘Barbotine’ pottery with the application of a slip in the form of thick patches or trails of clay

(From Jovanović 1968, sl. 1).

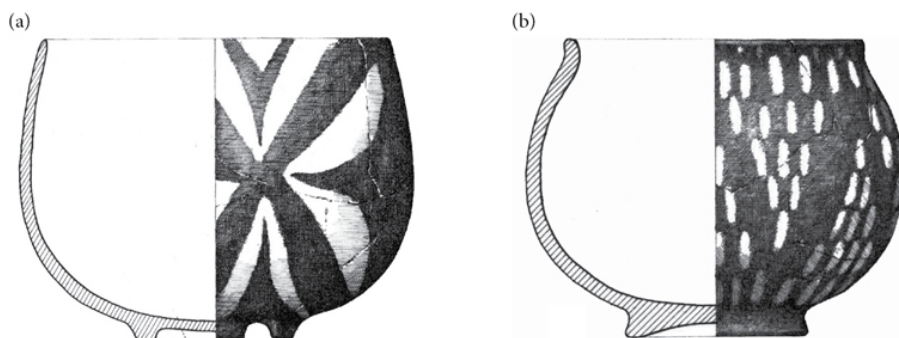


FIG. 28.3. The early Neolithic pottery from Anzabegovo-Vršnik culture (a, Anzabegovo, southern Balkans) and Starčevo (b, Donja Branjevina, northern Balkans) culture.

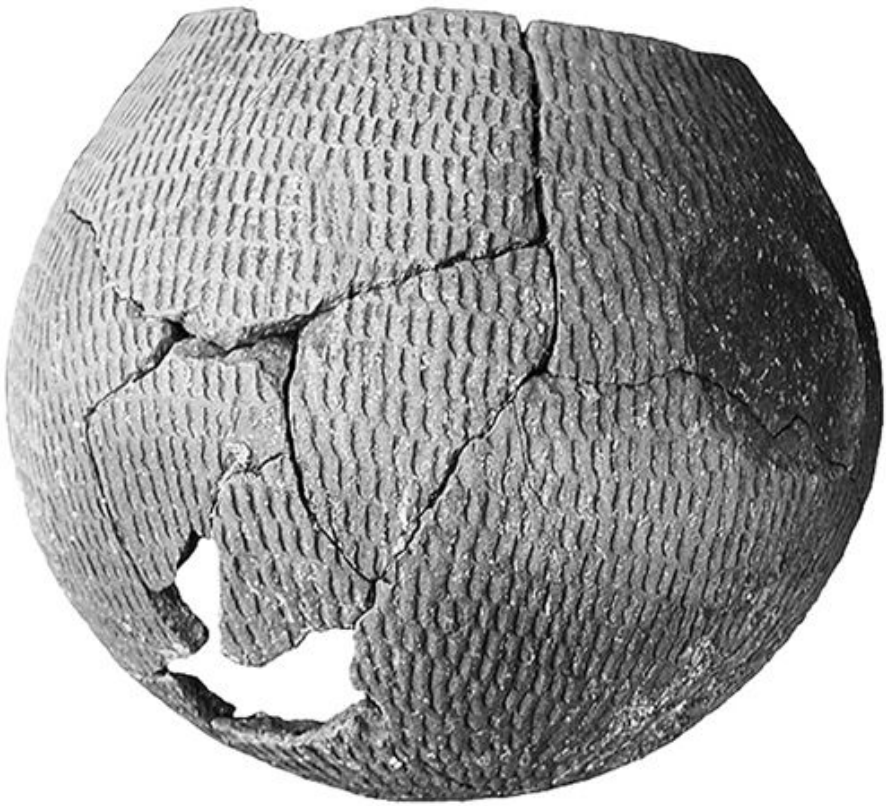


FIG. 28.4. The ‘Impresso (Cardial)’ pottery with decoration made with marine shell impressions (from [Marjanović 2009](#), sl. 75).

A similar migratory event was hypothesized in a ‘leapfrog’ or ‘salutatory’ demographic model that suggests migrations from one suitable environment to another. [Van Andel and Runnels \(1995\)](#) suggested that Anatolian farmers had moved towards the Danube and Carpathian Basin after reaching demographic saturation in Thessaly, which they had settled first. They thought the Larissa plain in Thessaly was the only region in the southern Balkans that could provide a secure and sufficiently large harvest for the significant population growth that led to the next migratory move north. It was calculated that farmers needed 1,500 years to reach saturation point and to migrate to the northern Balkans. The rate of spread was first calculated from the small series of radiocarbon dates available at the time. [Clark \(1965a, 1965b\)](#) allocated dates to three temporal zones running from the Near East to Atlantic Europe and covering the time span from 5200 BC to 2800 BC. He suggested that the south-east–north-west gradient of the dates reflected ‘the gradual spread of the Neolithic way of life’ and associated material culture from the Near East across Europe. This conclusion was later based on much bigger

series of standard radiocarbon dates covering the seventh millennium in south-eastern Europe and the sixth millennium BC in western Europe (Breunig 1987; Biagi et al. 2005).

The interpretative paradigm constructed around the dichotomy ‘civilized/barbarian’ continued to be highly significant in the context of academic controversy over the Neolithization process in south-eastern Europe, and thus pottery—and by proxy the manufacturers of that pottery—was interpreted in that light. It was embedded in two interpretative models: the ‘Balkan–Anatolian cultural complex’ and the ‘frontier model’. Both rely on ideas of inherent differences between European and Oriental materiality and potential. Both maintain a perception of an allochthonous Anatolian population in association with a well-developed farming economy and pottery technology, and an autochthonous Balkan population able to produce only simple and coarse pottery, that selectively adopted crop production and animal husbandry (Benac et al. 1979; Todorova 1998; Garašanin and Radovanović 2001; Perić 2002; Tringham 2000; Zvelebil and Lillie 2000; Lichardus-Itten and Lichardus 2003; Borić and Miracle 2004; Sanev 2004; Boroneanț and Dinu 2006).

The work of geneticists in the later twentieth century shifted the focus from phenotype to genotype, from cranial characteristic to classic genetic markers, from races to populations. Based on studies of the genetics of modern populations, Cavalli-Sforza et al. (1994) hypothesized that the transition to farming in Europe correlates with a massive movement of population from the Near East, without substantial genetic contribution from local Mesolithic populations. Since the revolution in the study of the human genome (Renfrew 2000; Renfrew et al. 2000) studies have focussed on detecting specific genetic markers which have been transmitted from prehistoric populations to modern ones. Mitochondrial DNA is present in both sexes, but inherited only in the maternal line; the Y-chromosome is present only in males and inherited exclusively through males (see Jobling et al. 2004). Because they are non-recombinant and highly polymorphic, they are seen as ideal for reconstructing human evolution, population history, and ancestral migration patterns. Thus different human nuclear DNA polymorphic markers (polymorphisms) of *modern* populations have been used to study genomic diversity, to define maternal and paternal lineage clusters (haplogroups), and to trace their (pre)historic genealogical trees and chronological and spatial trajectories. Particular attention has been drawn to the power of Y-chromosome bi-allelic markers, as they allow the construction of intact haplotypes and thus male-mediated migration can be readily recognized (Goldstein and Chikhi 2002; Richards 2003; O’Rourke 2003). King and Underhill (2002, 714) have argued that Y-

chromosome haplogroup J is ‘the best genetic predictor of the appearance of Neolithic painted pottery and figurines at various European sites’. The argument rests on the basic idea, proposed by [Cavalli-Sforza et al. \(1994\)](#), that a south-east–north-west cline of frequencies for selected Y-chromosome markers and associated haplogroups indicates the movement of men with Levantine genetic ancestry, and that this genetic influence coincides with the distribution of early Neolithic cultures in south-eastern Europe.

However, the invention of ceramics and the introduction of ceramic female and animal statuettes was certainly not within the cultural domain of Levantine hunter-gatherer societies, nor did they only appear on the ‘eve of the appearance of an agricultural economy’, as [Cauvin \(2000, 25\)](#) suggested. He even postulated an inter-linked economic and religious transformation, which explains why hunter-gatherers in villages outside the Levant did not develop subsistence production for themselves: their failure to ‘humanize’ their art and adopt new deities would have prevented them from making the transition to a new type of economy. Accordingly, Europe could not have become Neolithic until the ‘wave of advance’ and ceramic female figurines had reached the Balkans. A significant problem with this general argument is that Eurasian hunter-gatherer cultures *had* engaged in making ceramic figurines for many millennia before the appearance of food-producing agricultural societies. For instance, in central Europe, an assemblage of 16,000 ceramic objects—more than 850 figural ceramics—have been found in the Gravettian and Pavlovian (Palaeolithic) hunter-gatherer camps at Dolní Věstonice, Předmostí, Pavlov I, Krems-Wachtberg and Vela Spila ([Verpoorte 2001, 95–100, tab. 5.1](#); [Farbstein 2011](#); [Farbstein et al. 2012](#)). In many parts of Eurasia the introduction of fired-clay vessels first occurred in hunter-gatherer contexts, where it was associated with small-scale sedentary or semi-sedentary communities, millennia before the advent of agriculture ([Jordan and Zvebil 2009](#); [Gronenborn and Dolukhanov](#), this volume). In western Eurasia the use of ceramics appears in two distinct areas distant from one another contemporarily at c. 7000 BC: in the Near East and in the East European Plain (middle Volga River) (see above). Whilst the first was correlated with the genetically determined Y-chromosome haplogroup J in modern population ([King and Underhill 2002](#)), we may assume that the second correlates with the haplogroup N ([McDonald 2005](#); [Rootsi et al. 2007](#); [Derenko et al. 2007](#)) (Fig. 28.5). Thus, ceramic technology was reinvented more than once in Eurasian Palaeolithic and Neolithic contexts, and the fact that hunter-gatherer communities did make ceramic vessels underlines the problems with traditional perceptions of pottery as the marker of early Neolithic cultures (e.g. farming

communities) and of the south-east–north-west gradient of their dispersal across the Europe.

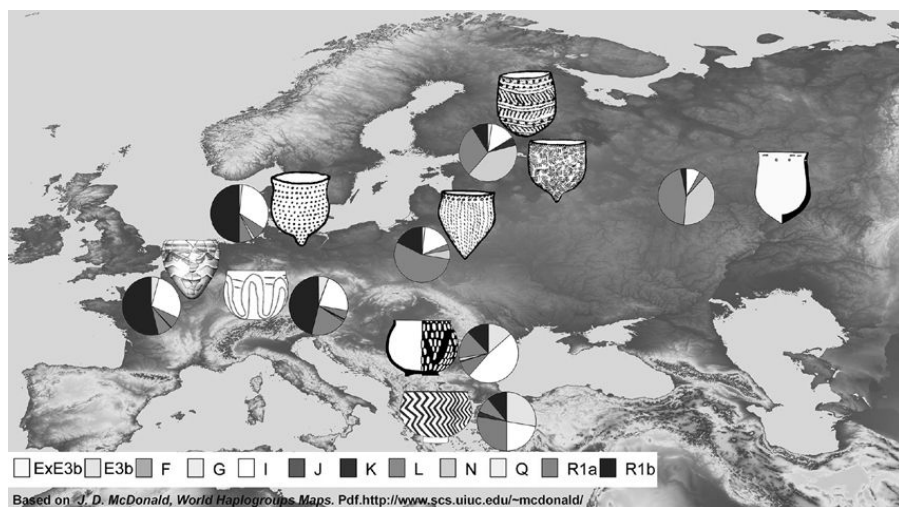


FIG. 28.5. The parallel clines of frequencies of Y-chromosome haplogroups J, E and N in modern populations in Europe and initial pottery distributions in Neolithic Europe. The haplogroup distribution is based on [McDonald's World Haplogroups Maps \(McDonald 2005\)](#) (from [Budja 2013](#), fig. 6).

Recent genetic studies, indeed, suggest that the modern peopling of Europe was a complex process, and that the view of a single demic event in the early Neolithic is too simplistic. The paternal heritage of the modern population of south-east Europe reveals that the region was both an important source and a recipient of continuous gene flows. The studies of the Y-chromosomal haplogroups J1 (M267), J2 (M172), E (M78), and I (M423) strongly suggest continuous Mesolithic, Neolithic, and post-Neolithic gene flows within south-east Europe and between Europe and the Near East, in both directions. In addition, the low frequency and variance associated with I and E clades in Anatolia and the Middle East support the European Mesolithic origin of these two haplogroups. The Neolithic and post-Neolithic component in the gene pool is most clearly marked by the presence of the J lineages. Its frequency in south-east European populations ranges from 2% to 20% although some lineages may have arrived earlier than the Neolithic, so that the levels of Neolithic immigration might still be overestimated ([King et al. 2008](#); [Battaglia et al. 2009](#)). Mitochondrial genome datasets and the timescale for lineages show on the other hand that possible candidates for Neolithic immigration from the Near East would include haplogroups J2a1a and K2a. It seems, however, the immigration was minor ([Soares et al. 2010](#)).

Furthermore, recent phylogenetic analyses of ancient mitochondrial and Y-chromosomal DNA (aDNA) extracted from Mesolithic and Neolithic human remains show that the genetic structure of the European population and the transition to farming cannot be explained by a gradual axial expansion (i.e. demic diffusion) of Levantine Neolithic farmers across Europe and sequential population replacements (Pinhasi et al. 2012). Advances in aDNA methods and next-generation sequencing have allowed new approaches which can directly assess the genetic structure of past European populations. Mitochondrial aDNA analyses now suggest regional variations in population trajectories in Europe, indicating that the process was far more complex and variable than was previously thought (see Bramanti et al. 2009; Burger and Thomas 2011; Haak et al. 2005, 2010; Lacan et al. 2011; Linderholm 2011; Sampietro et al. 2007; Skoglund et al. 2012). Unfortunately, we still do not know what happened to the Mesolithic hunter-gatherer and Neolithic populations in south-east Europe, as no aDNA studies have yet been carried out in the region.

Parallel archaeogenetic studies in modern population hypothesized that a single mutation -13 910*T (lactase gene) in the human genome which allows adults to consume fresh milk evolved within a group(s) of Neolithic pioneer stockbreeders among whom lactase persistence was rare, but who initially practised dairying in south-east Europe in the middle of the eighth millennium BP and later migrated towards central and northern Europe to an area inhabited by foragers (Gerbault et al. 2009). These studies suggested that natural selection began to act on a few lactase-persistent individuals of the Starčevo and Körös cultures in the northern Balkans, and then rose rapidly in the gene-culture co-evolutionary process on the wave front of a demic diffusion to central and western Europe in the area of Linear Pottery culture at 'around 6256–8683 years BP' (Itan et al. 2009, 7–8; Leonardi et al. 2012, 95). However, both scenarios seem to be unrealistic. The archaeogenetic analysis of Neolithic skeletons suggests that 'lactase persistence frequency was significantly lower in early Neolithic Europeans than it is today, and may have been zero' (Leonardi et al. 2012, 93; see also Burger and Thomas 2011). The analysis revealed an absence of the -13 910*T allele in central Europe, in the western Mediterranean and the Baltic in Mesolithic and Neolithic populations (Burger et al. 2007; Burger and Thomas 2011; Lacan et al. 2011; Linderholm 2011; Nagy et al. 2011).

The analyses of dairy fats in pottery suggest that milking and milk consumption and processing were widely adopted in the Neolithic in Eurasia. Biomolecular analyses of the lipids present in food which become absorbed and trapped in the pores of clay vessels indeed show evidence of dairy production in south-west Asia as early as c. 7000 BC.

The apparent intensification of dairy processing in north-west Anatolia at 6500–5500 BC was recognized as an early centre for milk processing, with cow's milk as the main source of dairy products in this region (Evershed et al. 2008; Thissen et al. 2010). This region had a central position in dispersals of Neolithic subsistence economies into Europe (Brami and Heyd 2011; Özdoğan 2011). However, degraded ruminant fatty acids in pottery suggest milk products and milk processing (i.e. the heating of milk) in the Starčevo-Criş culture at c. 5950–5500 BC and Körös culture at c. 5800–5700 BC (Craig et al. 2005). In northern Adriatic Vlačka culture context (Mala Triglavca) the processing of dairy products in ceramic vessels are well embedded in the time span 5467–5227 BC (Budja et al. 2013, 106–112). In northern Europe in the early Neolithic LBK complex it is dated to c. 5200 and 4900–4800 BC (Salque et al. 2013). The fermented milk products cause fewer or no mal-symptoms to lactase non-persistent individuals. Whilst the lactose content of fresh milk ranges between 4.42–5.15 g/g% in cattle, 4.66–4.82 g/g% in goats and 4.57–5.40 g/g% in sheep, it can be reduced to 50–60% by bacterial fermentation. Some processed milk products (such as cheese and butter) have very low lactose content, ranging from 0–3.7 g/g% (Nagy et al. 2011, 267). The beginning of utilization of lactic acid bacteria can be traced alongside the domestication of sheep, goat, and cattle. In milking and milk processing, the lactococci and lactobacilli were manipulated to initiate the fermentation that converts milk into yogurt, buttermilk, butter, and cheese. These certainly have advantages in storing and transporting dairy products and making them available in times of low milk production on one hand, and making milk available as a nutritional source throughout the entire life of the individuals on the other.

Overall, the combination of evidence from palaeogenetics and lipid analyses fits with the hypothesis that dairying and milk products consumption emerged before genetic adaptation. The archaeogenetic data appear inconsistent with a 'demic diffusion' model and with a hypothesized large Neolithic population replacement within the 'first demic event' (see Budja 2013). The Mesolithic–Neolithic transformation in Europe did not involve a single continuous dispersal process from the Near East into Europe; continuous Mesolithic, Neolithic, and post-Neolithic population and culture dynamics within south-east Europe and between Europe and the Near East, in both directions, is far more likely.

CONCLUDING REMARKS

Initial pottery distribution in Europe shows two almost contemporary but geographically distinct trajectories. The northern one is embedded in hunter-gatherer contexts; the southern is suggested to be associated with the transition to farming. The pottery assemblages in both contexts differ in vessel shapes, production techniques, and decorations. Vessels with conical bases were never made in south-eastern Europe, whilst coloured decoration never appeared on vessels in north-eastern and north-western Europe. Unpainted and very limited numbers of painted vessels were the first to appear in south-eastern Europe in the seventh millennium BC. Since coloured ornaments were applied to pots in south-eastern Europe, the dichotomy of colour and motif perception within the south-east European early Neolithic and between Europe and Near East becomes evident.

Geneticists currently suggest that the peopling of Europe is a complex process. Y-chromosomal paternal and mitochondrial maternal lineages in modern populations reveal the signatures of several demographic expansions within Europe over millennia, and gene flow between Europe and western Asia in both directions. These processes have been suggested for the Mesolithic, Neolithic, and Chalcolithic periods and seem to be more visible in the frequency of Y-chromosome markers in modern populations in the Balkans and Mediterranean than in other regions. Recent analyses of ancient DNA show a complex picture of varied population trajectories elsewhere in Europe, and whilst such studies are yet to take place in south-eastern Europe a similar picture is to be expected.

All these data indicate that the processes of the Mesolithic–Neolithic transformation were far more complex and variable than was first thought. We may suggest that the initial pottery distributions in Europe show the widespread and contemporary appearance of different pottery making techniques and ornamental principles within different populations, and cannot be explained as a single continuous dispersal process from the Near East into Europe.

NOTES

1. All the 14C data in the text are cal. BC and have been calibrated at 68.2% probability (2 σ), using the OxCal 2.4 programme.

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CHAPTER 29

LINEARBANDKERAMIK POTTERY AND SOCIETY*

JOACHIM PECHTL

INTRODUCTION

THE term ‘Bandkeramik’—later rendered more precisely as ‘Linearbandkeramik’ (Linear Pottery culture, or LBK)—was coined by Friedrich Klopffleisch in the 1880s (Klopffleisch 1883). He explicitly used ceramics to characterize an ‘archaeological culture’, thereby creating a terminology still in use today and establishing the tradition to accord a special place to the study of pottery. The choice of ceramics as a defining criterion for the LBK is amply justified: first, they are the most frequent finds category on both settlement and burial sites. Second, they are especially rich in characteristics which can be typologically classified. Pottery is the only finds category regularly represented even in small inventories that can be attributed to definite chronological periods and cultural groups. Third, ceramics are often lavishly decorated and are the only LBK sign-bearing artefact to occur in large numbers. Pottery is hence an LBK type fossil *par excellence* and is well suited to the application of complex statistical methods (e.g. van de Velde 1979; Stehli 1994; Pavlů 2000; Shennan and Wilkinson 2001). Thus, domestic life, stylistic behaviour, the transmission of traditions, social structures, and communication networks can be more intensively investigated using ceramics than with any other finds type. In spite of the justified criticism of a pure ‘pot prehistory’ (Nowak 2004, 7–9), the pottery of the LBK remains an archaeological source of primary importance.

CULTURE HISTORICAL POSITION

Over large parts of central Europe, the LBK is not only the first farming society, but also the first culture regularly producing ceramic containers. Typologically and genetically, its pottery can be derived

from the Carpathian Starčevo culture, as shown especially by early sites such as Brunn am Gebirge-Wolfholz (Austria) and Szentgyörgyvölgy-Pityerdomb (Hungary) (Stadler 2005; Bánffy 2004). The LBK hence stands at the end of the continental development of the Near-Eastern and Balkanic ceramic tradition. Generally, LBK pottery is typologically easy to differentiate from that of other culture groups. However, close relationships exist especially with the contemporary neighbouring groups of the so-called ‘eastern Linear Pottery culture’ in the north-eastern Carpathian Basin (Strobel 1997), the Vinča culture in the southern Carpathian Basin (Pavúk 2005, 21), and the Danilo culture, including the Vlaška group of the north-eastern Adriatic (Biagi 1996, 15). In addition, contact with other pottery-using groups is attested at the eastern periphery of the LBK, east of the Carpathians (Larina 2009).

Direct contact with the Mediterranean pottery tradition is present at the LBK’s north-western periphery. Especially east of the Rhine and in the Neckar area, and mostly on settlements dating to the earliest phase of the LBK, a kind of pottery appears which is technologically and stylistically entirely different from LBK ware: bone-tempered vessels with pointed bases, decorated with raised cordons and rows of double or comb incisions (Lüning et al. 1989). This material, labelled ‘La Hoguette’, shows typological links to the French Cardial culture and is believed to be connected with Mesolithic groups adapting isolated Neolithic cultural elements. Evidently, La Hoguette and LBK existed side by side for a long time, as La Hoguette influences are only visible on late LBK ceramics (Sommer 2001, 252–255). During the late LBK in the northern Rhineland, La Hoguette ceramics were seemingly superseded by ‘Limburg’ pottery, which has much more intensive connections with LBK ceramics (Lüning et al. 1989, 387).

In the early phases of the LBK, pottery is inter-regionally rather similar and remains very conservative. Typological development becomes increasingly dynamic in later phases, resulting in a marked and sometimes micro-regional splitting into different styles. The transition to the pottery traditions of the post-LBK middle Neolithic is regionally diverse and spans several generations (Eisenhauer 2002, 131). Thus, at Dresden-Prohlis, a continuous development from late LBK to earliest Stroke Ornamented pottery (SBK) can be observed in three successive houses (Link 2014, 82–86, 216–225), whilst a sharper stylistic break occurs in southern Bavaria (Pechtl 2009a, 110). Nevertheless, the old ‘Danubian’ traditions remain evident in the LBK’s successor cultures and only break off with the beginning of the late Neolithic (i.e. the mid fifth millennium BC).

TYPOLOGICAL DESCRIPTION

For the purposes of typological description, it makes sense to separate the earliest LBK from the succeeding phases of the ‘classic’ (early to late) LBK. Typically, pottery of the earliest LBK (Quitta 1960; Cladders 2001) has a high proportion of organic temper, with sand and small stones occurring more rarely. Vessel shapes are mostly rotationally symmetric and have flat bases or occasionally hollow pedestals. The most frequent type are small flat bowls with conical, rounded, or kinked profiles. High, sometimes closed bowls with biconical or rounded profiles and mostly accentuated rims, so-called *Kümpfe* (sing.: *Kumpf*; Fig. 29.1.1), are rarer. They are often decorated with knobs along their maximum diameter. Spherical bottles with s-profiled necks, often sporting double rows of lugs, are the third most frequent type. Decorations occur on only a small proportion of vessels. These consist of shallow u-profiled lines several millimetres wide. More rarely, there are finger impressions, large incisions, or grooves. Fine pottery is typically decorated with initially single, but later continuous surrounding motifs on the outer surface, mostly opposed spirals or meanders, arches, bundles of lines, and wavy bands of one to three separate incised lines (Fig. 29.1.1). Depictions of human faces and applied zoomorphic decorations are very rare. Coarser wares can be decorated all over with grooves and their surfaces can be roughened with a thick slurry.

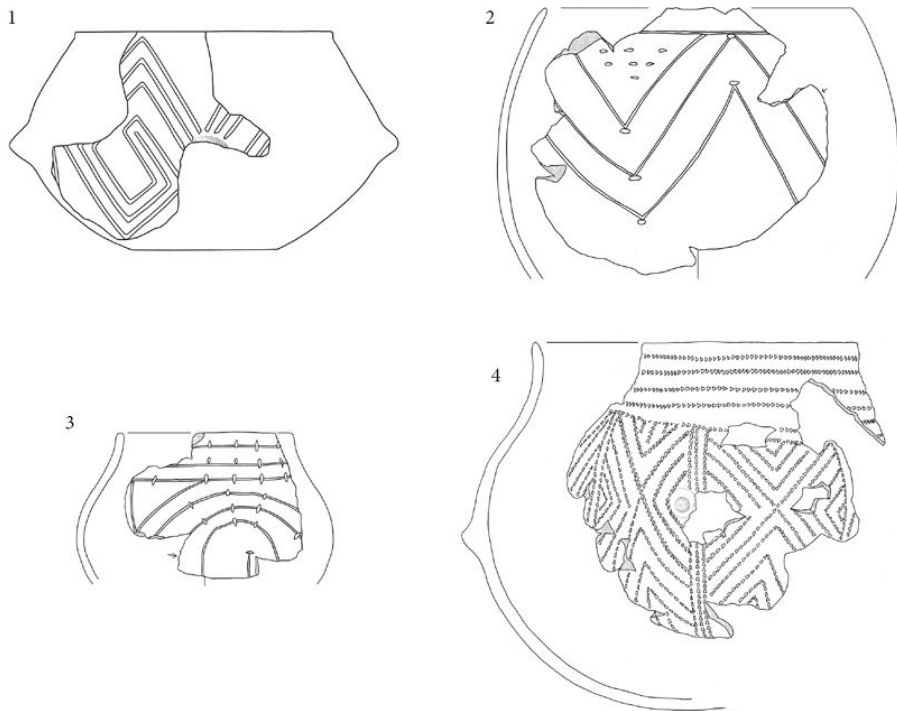


FIG. 29.1. Typological development of the shapes and decorations of LBK *Kümpfe* from southern Bavaria. 1: earliest LBK, Irlbach (redrawn after [Quitta 1960](#), 37 Abb. 22.1); 2: early LBK; 3: mid LBK; 4: later LBK (2–4: Stephansposching, [Pechtl 2009a](#)). Scale c. 1:4.

During the classic LBK, organic temper is largely substituted with mineral tempers or grog ([Engelbrecht and Lüning 2005](#), 170). As far as shapes are concerned, the emphasis shifts from open bowls to *Kümpfe*, and profiles in general become more rounded. *Kümpfe* and bottles have spherical and, in later phases, occasionally piriform bodies ([Fig. 29.1.2–29.1.4](#)). Accentuated rims disappear, with straight rims increasingly common for *Kümpfe* and bottles. As a rule, vessels have rounded bases. Knobs and lugs become more frequent. Decorations successively increase, both in terms of the proportion of decorated vessels and in terms of the extent of the decorated area and the diversity of execution ([Fig. 29.1.2–29.1.4](#)). The incised lines are now narrow and v-shaped in profile. Incisions steadily increase in frequency, whilst raised cordons, finger impressions, and pinched motifs on coarse wares slowly decrease. The application of motifs to different zones of the vessels follows an inter-regionally consistent pattern, although not all zones are actually used everywhere ([Fig. 29.2](#)). The main motif forms the core of the decoration. It consists of either single motifs repeated several times next to each other or of continuous motifs, which take up a large part of the surface around

the vessel's belly. The motif spectrum comprises the decorations already used during the earliest LBK, now supplemented with S-shaped hooks, net motifs, and angular bands. Different kinds of spirals dominate. A novelty are rim motifs added as continuous bands above the main motif. The free spaces between the constitutive motifs of the main decoration and the rim motif can be filled with so-called *Zwickel* motifs, often small, open triangles or sets of short lines. 'Secondary motifs' are either free-standing filler motifs or band-like zonal decorations which take up the overall shape and execution of the main motif and continue it downwards to the base or upwards to the rim. Finally, there are the structuring motifs, banded decorations which either lie between individual sections of the main motif or run centrally across its main axis of symmetry. The main and rim motifs especially are executed as decorative bands of lines, dots, or numerous combinations thereof. Hundreds of variants can be distinguished typologically (Kneipp 1998). Tendentially, incisions become more frequent and decorations increasingly baroque throughout the LBK (Fig. 29.1). Since the earliest LBK, the lines and incisions on a small proportion of vessels were filled with white, red, or dark coloured pastes (Meier-Arendt 1966, 50–51). There are also isolated instances of decoration on the interiors of vessels.

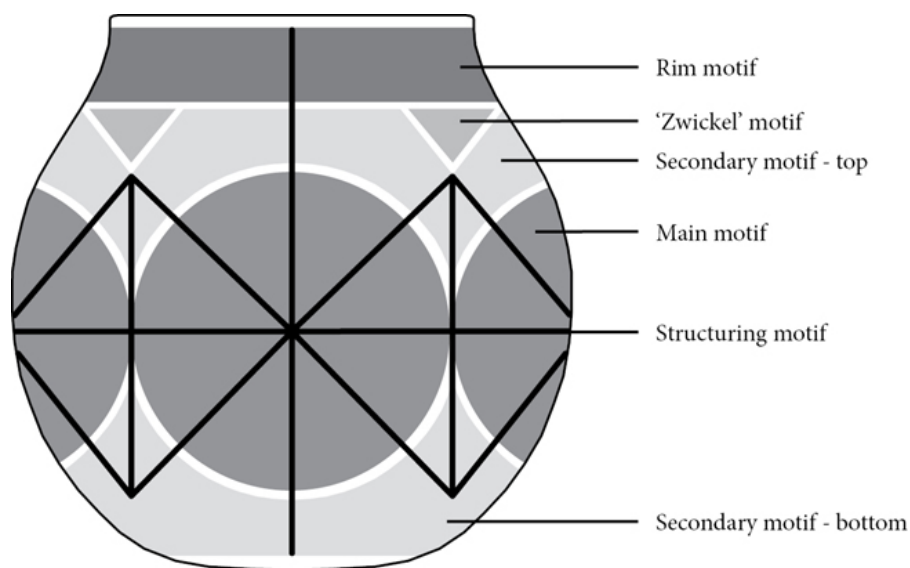


FIG. 29.2. Schematic representation of the syntax of Bandkeramik pottery decoration (Pechtl 2009a, 739 fig. 24).

CHRONOLOGICAL AND SPATIAL PATTERNS

Ethnographic studies on pots fired at low temperatures and the enormous amount of sherds even on short-lived sites show that most vessels would have broken within a few years at most (for further details, see [Pechtl 2009a](#), 124–127). Coupled with the enormous decorative variation, this allows us to establish fine-grained relative chronologies, with correspondence analysis now the methodology of choice ([Kerig 2005](#)). Such phase divisions have long existed for Bylany in Bohemia and for the Rhineland ([Pavlů et al. 1986](#); [Stehli 1994](#)); more recently, the material from numerous other regions has been analysed (e.g. [Čižmář 1998](#); [Kneipp 1998](#); [Pechtl 2009a](#)). Strictly from a modelling perspective, a temporal resolution within the range of single house generations (see also [Last](#), this volume) can be achieved. Of course, these phases should not be misunderstood as historical facts. Alongside all the source critical and methodological problems, we must acknowledge that stylistic change as a process can differ between households, so that different styles can co-exist within a small area ([Eisenhauer 2002](#), 133–142).

Spatial subdivisions of the LBK on the basis of ceramic material are also possible, even though systematic attempts are still rare ([Jeunesse 1994](#); [Rulf 1997](#); [Link 2014](#), 207–216). Although the earliest LBK appears uniform throughout the whole of its distribution, there are isolated regionally specific traits ([Strien 2009](#); [Pechtl 2009b](#)). From the early LBK onwards, large stylistic provinces can be identified, for instance the styles of ‘Flomborn’ in the Rhine-Main-Neckar area, ‘Áčkový’ in Bohemia, ‘Žofipole’ in Silesia, ‘Keszthely’ in southern Transdanubia, and the early ‘Music-Note style’ along the middle Danube ([Pavúk 2005](#), 33 fig. 10). In the following phases, this tendency towards an ostentatious emphasis on regional styles progressively increases, until in the late LBK numerous regional ceramic groupings exist ([Meier-Arendt 1972](#); [Jeunesse 1994](#), 15 fig. 13). Some have distribution areas only a few dozen kilometres across ([Kaufmann and York 1985](#), 89 fig. 8).

PRODUCTION AND DISTRIBUTION

Scientific and technological analyses of the raw material and production technology of pottery have so far been limited, making it hard to generalize on these aspects. The raw material was apparently obtained from clay-rich sediments of varied geological origin in the immediate vicinity of settlements ([Brink-Kloke 1992](#), 119–121; [Cladders 2001](#), 39; [Spataro 2003](#), 56; [van der Plas 1986](#), 38). However, within single sites clays from different sources were used ([Cladders 2001](#), 39; [Rauba-Bukowska 2009](#), 237; [Spataro 2003](#), 38).

Even special raw materials, such as graphite-rich clay, remain tied to the immediate vicinity of their sources (Tichý 1961, 81). Overall, easy accessibility to the raw clay seems to have been more important than quality (Cladders 2001, 39).

Little is known of clay preparation. Mostly, the material was only roughly ground to remove unwanted inclusions. Layers of naturally oriented clay minerals in sherds show that often the material was neither soaked nor thoroughly processed when dry, nor even intensively kneaded (van der Plas 1986, 32). Many clays naturally contain high proportions of non-plastic elements, which can often not be confidently distinguished from artificially added tempers. Especially fine wares were probably partly made from unaltered raw clay (Franklin 1998, 5–6). As a rule, however, potting clay was artificially tempered, especially with sand and, in the earliest LBK, the obligatory organic components (van der Plas 1986; Cladders 2001, 39). Grog, too, is attested (van der Plas 1986, 39), whilst crushed stone and bone are much rarer (Franklin 1998, 7; Rauba-Bukowska 2009, 238–240). The amount, kind, and composition of the temper vary considerably and show a clear correspondence to the size and type of vessel produced (Pechtl 2009a, 34–36; Rauba-Bukowska 2009, 245–246).

Vessels were exclusively shaped by hand. Smaller items were formed by pressing a clay ball between the fingers. Sometimes, the limits of coils can be identified on the breaks of sherds, showing that usually the coiling technique or perhaps the slab technique was employed (Brink-Kloke 1992, 115). The paddling technique may have been used occasionally, perhaps especially for larger pieces. Handles and other three-dimensional additions were applied at a later stage to an area of the surface previously roughened with a pinch for better adhesion. A broad spectrum of techniques exists for treating the vessel surface: untreated, smoothening when wet, burnishing, polishing, and applying a graphite coating. Prior to this, a slip was at least occasionally applied, especially to fine wares. Coarse wares sometimes feature a rough slurry coating with finger impressions (Cladders 2001, 44). Typical LBK decorations consist of incisions and impressions, made on the finished surface when leather-hard (Brink-Kloke 1992, 146). In general, lines were incised first and round incisions or music notes added later as appropriate. Coarser wares are more likely to be decorated with plastic elements, such as finger impressions, pinching, or raised cordons.

Before firing, the pottery had to be thoroughly dried. Phenomena such as cracks from drying are very rare, showing that this process happened slowly and carefully (Pechtl 2009a, 37). Pottery was mostly soft-fired in temperatures of only 550–850°C (van der Plas 1986, 39;

Franklin 1998, 9–11; Rauba-Bukowska 2009, 239). The firing atmosphere was uneven and often fluctuated, resulting in many vessels with uneven surface colour. However, there is a tendency to fire coarser vessels in an oxidizing atmosphere and finer wares in a reducing atmosphere (Brink-Kloke 1992, 116; Pechtl 2009a, 38–39). This means that firing, although only partly controllable, was adjusted to the desired products and accordingly carried out either in bonfires or as pit firing. Finally, in exceptional cases vessels were further decorated by adding coloured incrustations to the incised lines or by painting with mineral pigments (Meier-Arendt 1966, 50–51); only for the Slovakian/Moravian Želiezovce group is painting frequently observed (Pavúk 1969, 296).

Pottery making necessitated only a modest number of tools. The usual digging implements were probably used to obtain the clay, then perhaps pulverized with saddle querns or wooden implements, likely also used for preparing temper (Franklin 1998, 5). For shaping, surface treatment, and decoration there were wooden or bone scrapers, spatulae, points, and combs, as well as burnishing stones, perhaps even flint tools (Zeeb-Lanz et al. 2006, 72 fig. 11.4; Kind 1989 plate 87.2). Potentially turnable work surfaces such as boards, pieces of bark, or skins can be supposed. Large, round-bottomed shapes were probably manufactured whilst they stood in depressions in the ground, on rings made from organic materials, or on curved sherds.

In summary, potters could draw on a tightly circumscribed canon of techniques, which were not particularly variable spatially or chronologically. Single pieces or small series were produced in a settlement context, with techniques carefully selected according to the future demands on the vessels. The necessary tools were very simple, frequently comprising items also employed for other purposes and hence anyway present around the house. At most a small investment would be needed to obtain them. Techniques, too, were generally simple. Whilst their successful use required some instruction, and especially aptitude and practice, a specialized apprenticeship was unnecessary. This technical simplicity of pottery making contrasts with a substantial labour investment and, in many cases, exceptional care during production. Especially for the laboriously burnished and elaborately decorated fine ware, production times are estimated at several hours per vessel (Fig. 29.1.4) (Pechtl 2009a, 129).

Investigations at a settlement level have shown that certain stylistic characteristics are confined to single houses or small groups of buildings, or occur in successive houses on the same farmstead (Friedrich 1994, 254; Strien 2005, 189–192; a ‘farmstead’ is here defined as a cluster of houses succeeding each other in a defined area

over time, see [Claßen 2009](#), 97). Hence, house-specific styles, sometimes even the products of individual potters, can be recognized ([Krahn 2003](#), 526; [Stadler 2005](#), 277 fig. 112). This shows self-sufficient production at the household level. At most, immediately adjacent households were also supplied. Only special items, such as ceramics made from graphite-rich clay or unusually lavishly decorated, were involved in small-scale exchange between settlements ([Tichý 1961](#); [van Berg and de Menthen de Horne 1989](#)). At the inter-regional scale, there is a certain harmonization in typological development, hinting at long-distance communication networks. However, the direct exchange of ceramics over long distances—even just as containers for other items—is rarely identifiable (e.g. [Strien 1989](#)).

The number of new vessels required by an average household at the Bavarian site of Stephansposching has been estimated at roughly 12 pieces per year ([Pechtl 2009a](#), 124), which could be produced in around three manufacturing episodes. Potting was hence probably a seasonal activity, carried out as and when required by individual household members ([Pavlů 2000](#), 282). The fact that the shallow lines sometimes pre-incised on pots as aids for executing the main motif do occasionally diverge from the actual decoration implies a lack of production routine. A few small vessels are made in an exceptionally rough manner, with shapes and decorations entirely divergent from the known pattern (e.g. [Pechtl 2009a](#) plate 95.1472–2). These are probably practice pieces made by children, showing that pottery making was embedded in family life. There are indeed other indicators for a gender- and age-dependent division of tasks in the LBK, for instance suggested by the differential distribution of stone adzes and quernstones in graves ([Pechtl 2009a](#), 243–246; [Hofmann and Orschiedt](#), this volume). In analogy to numerous ethnographic examples, we can suppose that potting was carried out by women ([Pavlů 1997](#), 132).

In this context, it is interesting to note that on the Aldenhovener Platte in the Rhineland, main motifs have farmstead-specific characteristics ([Krahn 2003](#), 516), whilst *Zwickel*-motifs seem to jump between the houses of different farmsteads from phase to phase ([Krahn 2003](#), 525–526). Similar phenomena have also been observed at Vaihingen in south-west Germany and Bylany ([Strien 2005](#); [Pavlů 2000](#), 172). This can best be explained with the idea of female potters embedded in a marriage system with virilocal residence rules: women learnt pottery making as children, but after marriage were subject to a strong social control, so that decorative elements regarded as important were carried out according to the traditions of the husband's family, with the wife's own traditions continued for

subordinate motifs (Sommer 2001, 260). Married-in wives, initially strangers in their new household, have a weak social position. Producing ostentatious and individually recognizable ceramics could be a sign of good household management and an effective means to improve this position (Pavlů 1997, 103–105; Pechtl 2009a, 130). The increasingly complicated decorations could be interpreted as an almost inflationary increase of an ostentatious labour investment. The massive increase in decorative variations in the later LBK is hence not down to simple evolution, but to a clear preference for innovation (Shennan and Wilkinson 2001), the potters' active craving for the new. The receivers of these stylistic messages were first and foremost other household members and the immediate social environment of the potters.

USE AND DEPOSITION

LBK pottery is found on settlements, cemeteries, and special-function sites. Pottery from settlements is generally discarded material, redeposited several times, for instance in middens, before being incorporated into pit fills (Pechtl 2009a, 32–33, 58–60). In situ finds of ceramics in their context of use are rare. There are isolated instances of large vessels, mostly closed shapes, found in storage pits, suggesting a corresponding function (Pavlů 2000, plate 15.2; Kind 1989, 110–111, figs. 77–78). The well at Zwenkau yielded a small decorated bottle with a piece of string still tied around its neck (Engelbrecht and Lüning 2005, 170 fig. 301). This proves the use of bottles for storing and transporting water. Finally, at Vedrovice a thick-walled *Kumpf* was found in the cavity of an intact pit oven (Berkovec and Veselá 2004, 14 fig. 41), suggesting a use for heating substances, probably food.

Definite instances of deliberate deposition of pots and their removal from primary use are extremely rare and probably connected to ritual activities, for instance in the deposits from the Herxheim pit enclosure (Zeeb-Lanz et al. 2006, 74–76). To this can be added deposits in conspicuous natural places, for instance the Bavarian Jungfernhöhle cave, used for secondary burial, or the nearby Motzenstein rock tor (Kunkel 1955; Hofmann and Orschiedt, this volume). The situation is different for graves, in which ceramics are quite regular grave goods. There are rarely more than one or two vessels (Jeunesse 1997, 70) and no specially made funerary ceramics, although certain shapes and decorations were apparently selected (Friedrich 1994, 340). Probably, these pots mainly functioned as containers for food or drink, but some, as at Essenbach in Bavaria, had been filled with colour paste

(Jeunesse 1997, 80).

Chemical analyses to determine contents are still at an early stage. So far, the lipids of linseed and hazelnuts, more rarely of cereals, poppy, and animal products, including dairy fat, have been identified (Rottländer 1990, 10–14; Salque et al. 2012, 56–58). However, clay containers were so porous that liquids slowly seeped through the walls, which had to be additionally impregnated using several organic substances, including fats. This must be taken into account in chemical analyses. In principle, LBK pottery is heat-resistant and useable as cooking ware (van der Plas 1986, 40), but the average life expectancy, especially of frequently carried vessels and cooking pots, was probably a few years at most (Pechtl 2009a, 126).

Ceramics are little differentiated formally. For instance, the inventory from Stephansposching is dominated by *Kümpfe* (>80%), whilst bottles make up roughly 9% and bowls 7%. All other shapes together account for only about 2% (Fig. 29.3) (Pechtl 2009a, 55). However, the frequent shapes can be further subdivided according to their execution and decoration. The volumes of pots, too, are highly variable. In Bylany, most vessels could contain less than 5 litres, but larger examples of up to 20 litres capacity regularly occur (Pavlů 2000, 116, fig. 4.4.3.a). A piece with a staggering 90-litre capacity is known from Murr in southern Bavaria (Neumair 1992, 21–22).

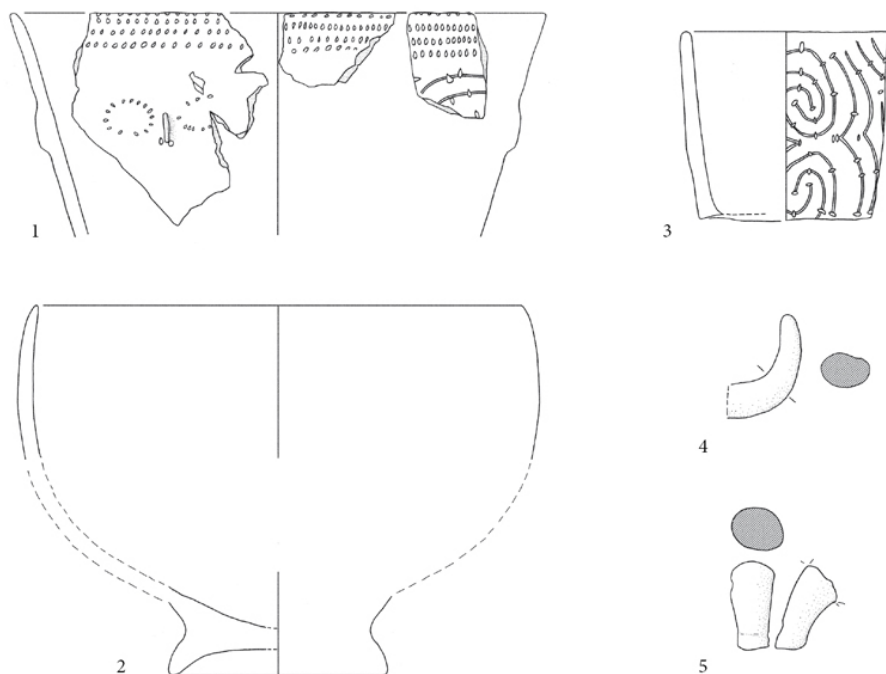


FIG. 29.3. Examples of rare pottery forms from the LBK site of Stephansposching

(southern Bavaria). 1: face pot; 2: pot with hollow pedestal; 3: richly ornamented steep-sided beaker; 4: three-dimensional ‘small horn’, probably from a zoomorphic vessel; 5: three-dimensional leg, probably from a footed bowl or figurine

(all from [Pechtl 2009a](#)). Scale c. 1:3.

At Bylany, the number of vessels seems to correlate with the number of inhabitants of a house (estimated in relation to house length), so that at least part of the ceramics were for individual use ([Pavlů 2000](#), 282). Assuming that pottery was mostly used for food preparation and consumption, the following model can be suggested ([Fig. 29.4](#)): fine and often decorated pottery was used for serving, eating, and drinking. The frequent *Kümpfe* with roughly 0.5 litres capacity were probably for individual use, larger *Kümpfe* and bottles for communal use. Medium-sized, more coarsely made and rarely decorated pots were for short-term storage and mainly for food preparation. Large and heavy, mostly closed shapes were intended for longer-term storage ([Pavlů 2000](#), 121, fig. 4.5.4.c, 282; [Pechtl 2009a](#), 124–127).

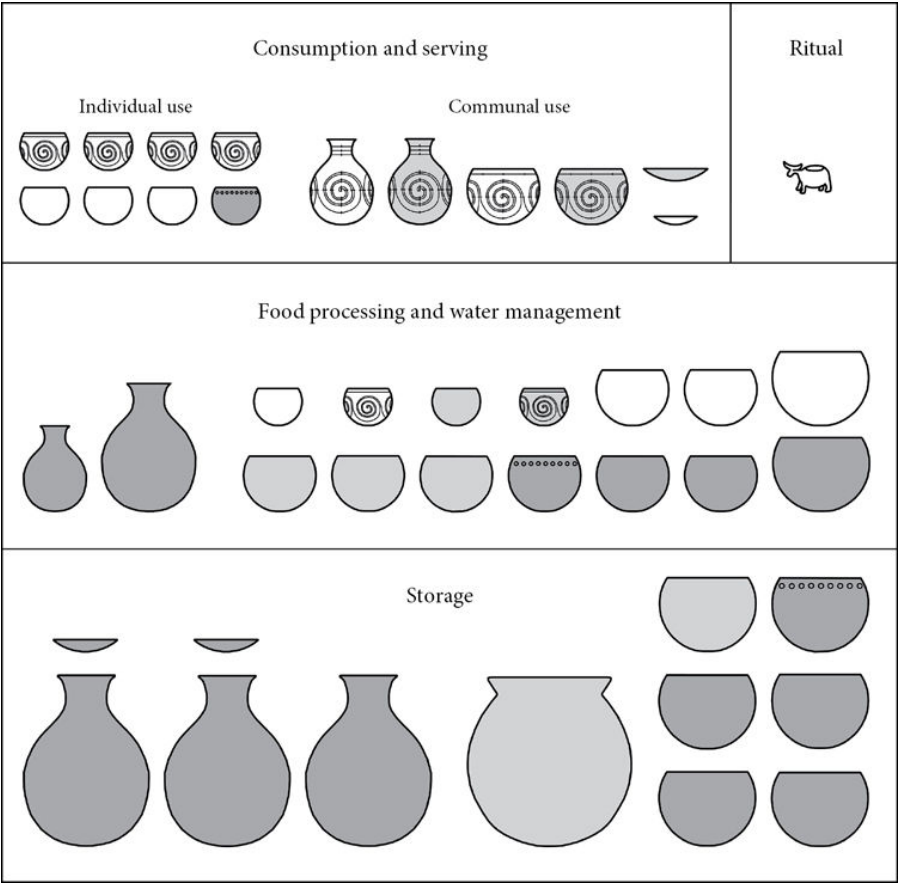


FIG. 29.4. Suggested reconstruction of the ceramic inventory in use at any one time in an average household at the LBK site of Stephansposching (southern Bavaria). The shapes have been grouped into sets by type: bottles, *Kümpfe*, bowls, open forms and special forms (here represented by a zoomorphic vessel). The size of the symbols shows the vessels' capacity: small symbols < 1 l, medium-sized symbols 1–5 l, large symbols > 5 l. The clay quality is differentiated by colour: white = fine ware, light grey = medium fine ware, dark grey = coarse ware. The proportion of decorated pottery is indicated by a spiral motif for fine ware and a row of finger impressions for coarse ware (after data from [Pechtl 2009a](#), 55, 124–127, 736 fig. 19B, 755 fig. 46B).

At the Stephansposching settlement, the inventory of an average household estimated at ten people would have comprised about 43 vessels, with a roughly equal number of items for storage, cooking and food consumption, as well as one example of a special shape ([Pechtl 2009a](#), 127, fig. 46B) (Fig. 29.4). There are hints of complex object biographies with several repairs and changes of function ([Pechtl 2009a](#), 56; [Engelbrecht and Lüning 2005](#), 170, fig. 301; [Elburg and Herold 2010](#), 25, fig. 4). For instance, some *Kümpfe* from Bohemia were originally decorated with incised lines, but later drastically redecorated using red paint or by coating with black birch tar and applying lightly coloured bark pieces ([Jíra 1911](#)). Domestic pottery existed alongside vessels of different organic materials, only rarely preserved, such as baskets or bark and wooden containers, which are mostly undecorated ([Engelbrecht and Lüning 2005](#), 171, fig. 302). The relatively unspecialized household ceramics were probably also used for a variety of crafts, as separate items for such uses can only rarely be identified, but there are sieves ([Bogucki 1984](#)), clay spindle whorls, and loomweights ([Pechtl 2009a](#), 264–267). It remains unclear whether these items were deliberately fired. There are also isolated instances of personal ornaments in clay, namely beads and armrings ([Brink-Kloke 1992](#), 125–126). A ritual purpose seems likely for the rare special shapes, such as miniature vessels, steep-sided beakers, vessels with representations or human faces, so-called altars, and zoomorphic and anthropomorphic figurines (Fig. 29.3) ([Höckmann 1972](#)).

Thus, ceramics were mostly used in and immediately around the house for domestic tasks, such as fetching water. Fine ware made for lavish serving vessels, also used for formal occasions. Especially during rituals and feasts, certain items became visible to a wider audience. For instance, we can envisage the unusually large Murr vessel ([Neumair 1992](#), plate I), with its 90-litre capacity and its unique decoration, as an important prop during a large-scale ceremony.

SIGNS AND SYMBOLS

The lavish decoration on many vessels is more than the result of an incidental aesthetic expression, but probably considered effective in several ways, for instance as magical protection for the vessel's contents or as expression of social relationships (Pavlů 2000, 282). In any case, a communicative function can be supposed, with stylistic behaviour employed consciously and subconsciously, for instance in the context of a multi-layered definition of identity (Whittle 1996, 171; Rulf 1997, 13; Lukes 2004, 19). Most likely, the life of early farmers was strongly shaped by ritualized behaviours, resulting in great attention to sign-like decorations (Eisenhauer 2002, 132). Thus, in a formalized context decorated ceramics may have become a token of hospitality (Whittle 1996, 171). The complex decorations seem to work as a hierarchy of meanings active at different social scales, beginning with the overall style, then the different motifs of the main, rim, and *Zwickel* decorations, down to the specific way of their execution (Rulf 1997, 15). Different decorative zones are independent of each other and develop along different lines, indicating different meanings (Rulf 1997, 92; Pechtl 2009a, 134).

Style expresses group identities and reveals the boundaries of communication networks (Rulf 1997, 217, fig. 72), which in the LBK remain stable over several centuries. Thus in Alsace, two stylistic zones meet, with the settlement of Wettolsheim located at their boundary. There, both traditions exist side by side for many generations without resulting in an admixture of the two styles (Jeunesse 1994, 10–12). At Stephansposching, the differences between two competing styles were emphasized more and more strongly over time (Pechtl 2009a, 82). However, the radical stylistic change from LBK to the succeeding early Stroke Ornamented group in south-eastern Germany, Austria, and Bohemia or the Hinkelstein group in south-western Germany suggests that style also expresses ideology (Spatz 2003) and is hence an object of social discourse. On the other hand, these phenomena could be the creations of specific groups, emically defined through descent, which, at least during the increasing tribalization of the later LBK, most probably had 'ethnic' connotations.

The main decoration comprises a restricted spectrum of motifs, mainly arches, wavy lines, and spirals, which also exist in rectilinear form as angular bands and hooked meanders. Whilst this repertoire sees changes in the relative frequency of motifs, it remains essentially stable over at least 400 years, before there are tendencies towards its dissolution at the end of the LBK (Fig. 29.1) (Pavlů 2000, 284). During the first centuries of development, these symbols are treated in a very orthodox way and applied as emblematic single signs without any additional motifs (Fig. 29.1.1). This fosters social solidarity among

this newly emerged and expanding farming society and consciously manifests their new, 'Neolithic' identity (Frirdich 1994, 357; Sommer 2001, 257–258; Lukes 2004, 25; Strien 2009). However, some regional or, arguably, clan-specific differences can already be observed (Strien 2009; Pechtl 2009b). In the further development of the LBK these motifs are kept, but increasingly integrated with other elements to create an overall composition (Fig. 29.1.2–1.4). Main motifs are treated much more conservatively than other decorative elements, supporting the idea that these were symbols with fundamental religious and cosmological meanings. The execution of the main motifs is influenced by household-specific traditions, showing a tendency to small-scale cultural differentiation (Frirdich 1994, 254; Krahn 2003, 515; Shennan and Wilkinson 2001, 592). During this process, newly established households enjoyed much greater freedom than older ones, perhaps because the lack of aged persons meant a reduced social control over the execution of motifs (Frirdich 1994, 256, 356). At the end of the LBK, several partly contradictory tendencies can be observed. On the one hand, the old decorative syntax and its associated motifs are abandoned, but on the other hand there is now a variety of concurrent styles which in themselves appear rather orthodox. There seems to have been a vigorous discourse perpetuated with and about ceramic symbols. Consequently, the monotony of, for example, early Stroke Ornamented ware, with its angular bands with dividing motifs, can be understood as a deliberately flaunted, religiously motivated counter-movement (Spatz 2003; Pechtl 2009a, 134; Link 2014, 216–229), part of a renewed tendency to limit oneself to emblematic main motifs.

The actual representational content of the main motifs remains more difficult to discern. Pots with face decorations, or shaped like animals or people, show that an equivalence of vessel and body applied to at least some items (Fig. 29.3.1, 29.3.4, and 29.3.5). However, clearly anthropomorphic motifs are extremely rare in the LBK. It is only the early Stroke Ornamented ware which turns almost exclusively to anthropomorphic motifs, albeit very abstract ones (Spatz 2003, 584–585). A stylized representation of horned animals has been discussed for the mirror-inverted double spirals of the early LBK (Pavlů 2000, 284). The main motifs are successively complemented with *Zwickel*-, rim, secondary, and structuring motifs. In contrast to the respectful treatment of the main motifs, these peripheral decorative zones are designed with a much greater degree of freedom (Pavlů 2000, 161; Krahn 2003, 515). These are apparently appropriate opportunities for innovation and individual expression and hence for messages at different levels (Pechtl 2009a, 134). The active striving for stylistic innovation begins here and, after a

considerable delay of perhaps some generations, reflects back on the execution of the main motifs. In the Rhineland, the bands of the main motifs follow farmstead-dependent traditions, whilst *Zwickel*-motifs reflect the influence of individual potters and sometimes shift between farmsteads or neighbouring settlements from one generation to the next (Krahn 2003). Assuming pottery-producing women in a virilocal system, this implies that *Zwickel*-motifs were passed down the female line and not subject to the same pressure to conform which forced wives to adopt the band types current in their new household and passed down the male line. Bands and *Zwickel*-motifs hence carry different information on the potters' family connections and provenance. At Vaihingen *Zwickel*-motifs characterize specific farmstead groups, which shows a different modality of transmission but means that here, too, membership of certain lineages was signalled (Strien 2005, 195).

The proportion of decorated ceramics, as well as the extent of surface area decorated and the variation of motifs steadily increase throughout the LBK (Fig. 29.1). This results in a loss of importance for the main motifs' fundamental religious-cosmological symbolism and an increasing emphasis on the personal or family-dependent messages of the peripheral decorative zones. Whilst early on, decoration was a sign of cultural unity, it later became a medium for expressing regional identities or family and generational differences (Sommer 2001, 255). At the beginning of the LBK (5500–5300 BC), norms concerning the design of pottery were strictly monitored (Friedrich 1994, 354; Sommer 2001, 260). Potters could only gain personal prestige by manufacturing high-quality products and adhering to norms perfectly, that is, by endlessly replicating traditional designs. Later on (5300–5000 BC), changes in decoration were not only socially accepted, but innovation was explicitly sought (Shennan and Wilkinson 2001, 591–592), offering potters an arena for self-representation and conferring prestige through unusual decorations. This set in motion a self-perpetuating vicious circle, leading to increasingly baroque decoration and an almost inflationary increase of labour investment, a development only interrupted in the beginning of the middle Neolithic (5000–4900 BC), when ceramic decoration is consciously limited.

IN CONCLUSION

LBK ceramics thus played an active role in society. They undoubtedly held a prominent position in the set of available material culture: if we imagine an average LBK longhouse with its inventory, pottery,

with several dozen objects, would be strongly visible and characterize living and cooking areas, as well as zones dedicated to more formal gatherings. In addition, during social occasions pottery was probably one of the most important sign-bearing media, a function not restricted to representational special forms. Handling pottery was also a crucial part of countless everyday household tasks, private and public ritual practices, and large-scale social and religious events. Even in a purely physical sense, pottery shaped all these contexts, but it also adopted the diverse connotations of these activities and therefore could itself become the indispensable symbol of different practices, their meanings, and the Neolithic way of life itself. In short: it decisively shaped the cultural *habitus* of the LBK.

The material imposed few technical restrictions, and the constant need for new vessels, brought about by the short life expectancy of pottery, forced potters to produce regularly. This enabled a large part of the population to dedicate themselves to aesthetic elaboration and personal expression and to create new fashions in this medium. Pottery production and use gave women, whose social position was weakened by virilocal residence rules, the opportunity to demonstratively draw attention to themselves and to work creatively at their role in society (Sommer 2001, 260). However, innovation was mostly restricted to decoration, and even here basic structures and fundamental syntactic rules remained valid throughout the LBK. Considering the potential of clay as a plastic raw material, it is significant that the same shapes were produced far into the middle Neolithic. Overall, then, the use of vessels and the cultural settings in which they were important seem to have changed rather little and strongly restricted the kinds of innovation that were tolerated. This reinforces the crucial role of ceramics in the creation of cultural identity.

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CHAPTER 30

CERAMICS AND SOCIETY IN NORTHERN EUROPE

JOHANNES MÜLLER AND RICK PETERSON

Southern Scandinavia and Northern Germany

JOHANNES MÜLLER

THE ORIGINS OF POTTERY IN SOUTHERN SCANDINAVIA AND NORTHERN GERMANY

The earliest types of pottery in southern Scandinavia and northern Europe have different origins and histories of development. On typological grounds we are dealing both with pottery in a late Mesolithic context (Ertebølle c. 4800 BC onwards) and pottery associated with Neolithic ways of life (Funnel Beaker societies, starting c. 4100 BC) (Fischer and Kristiansen 2002; Jöns et al. 2009; Klassen 2004). The relation and origin of both is a focus of debate: whilst Ertebølle ceramics were seen traditionally to reflect southern influences from contemporary early horticulturalists on the Nordic Mesolithic foragers, some researchers are modelling different origins for Ertebølle and Funnel Beaker (*trichterbecher*, or TRB) assemblages. Ertebølle pottery is associated with Mesolithic/Epipalaeolithic pottery traditions, stretching from central Siberia to Brittany (Jordan and Zvelebil 2009; Matiskainen 2011; Andersen 2011; Piezonka 2011). The use of pointed-bottomed vessels is known from foraging societies which integrated some domesticates and cultivates into their economy but did not change their foraging identity. No pottery or other imports imply any kind of innovative southern influences on this development; rather ceramics were an independent innovation. By contrast, Funnel Beaker pottery is associated with changes related to the spread of horticulture into the North European Plain, enhanced by the expansion of an enclosure-building society from the west (early Michelsberg of the Paris Basin and the Rhinelands) and late Lengyel

developments within south-eastern horticultural communities (e.g. Gatersleben groups of the Middle-Elbe–Saale region). Funnel Beaker ceramic assemblages are seen as a result of the inter-linkage of Michelsberg, late Lengyel and late Ertebølle ([Fig. 30.1](#)) at the southern fringe of later Funnel Beaker distribution ([Klassen 2004](#); [Müller 2011a](#)).

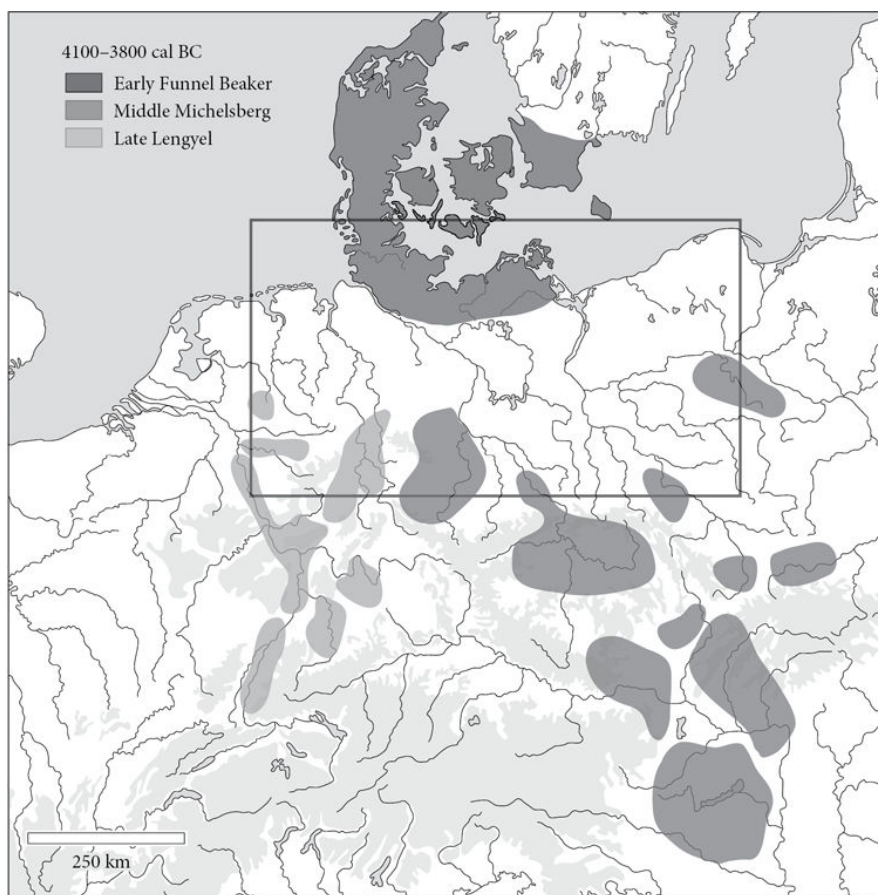


FIG. 30.1. The interaction spheres of early Funnel Beaker Societies (after [Müller 2011](#), 295, [fig. 30.7](#). Drawn by Holger Dieterich).

Investigating the origins of pottery in the southern Scandinavian Neolithic often involves questioning the ideological differences between foragers and early horticulturalists: is there a clear separation of forager diets from horticultural diets, from routinely eating fish to scarcely using marine resources? The model of an evolution of early Neolithic pottery shapes out of late Mesolithic pottery is still open to question, for which the different use of ceramics in different societal spheres could be taken into consideration.

REGIONAL AND CHRONOLOGICAL FRAMEWORKS

Since early discussions on the absolute dating of the southern Scandinavian and northern German Neolithic (Hoika 1994), the resolution of chronologies has improved rapidly (Müller et al. 2010). Whilst 20 years ago different regions were still treated as one, recent studies confirm quite different regional shifts in the introduction of new ways of life, and especially of new pottery styles (compare Lübke and Terberger 2005 with Koch 1998). A regional and chronological framework for ceramics has been produced based on ceramic decoration and shape (Fig. 30.2). Whilst spatially bounded and chronologically restricted regional ceramic groups are indicated by specific shapes, techniques, and ornamentation (Andersen 1997; Andersson et al. 2004; Ebbesen 1975, 1978; Hartz and Lübke 2004; Hoika 1987; Hulthen 1977; Koch 1998; Madsen 1994; Malmer 2002; Meurers-Balke and Weninger 1994; Nielsen 1994; Persson 1999), general trends in decoration ratios or the range of vessel shapes are linked to social frameworks of the Funnel Beaker (TRB) North Group.

Southern Scandinavia/Northern Plain Chronology					Northern Lower Mountain Range Chronology						
cal B.C.	Period	Northern Jutland	Seeland/ Scania	Southern Jutland/ Mecklenburg	Lower Countries / NW Germany	Altmark	Middle-Elbe-Saale	Westfalia/ Hessia	Period	cal B.C.	
2100	LN 1	Early Dagger groups				Early Dagger/ Aunjetitz	Early Aunjetitz	Early Bronze Age	Bronze Age	2100	
2200										2200	
2300	YN 3	Late Single Grave groups				LSG / Schönfeld	Late Corded Ware/ Bell Beakers		Final Neolithic	2300	
2400										2400	
2500	YN2	Middle Single Grave groups				MSG/ Schönfeld	Middle Corded Ware			2500	
2600										2600	
2700	YN 1	Early Single Grave groups				ESG/ Schönfeld	Early Corded Ware			2700	
2800										2800	
2900	MN V	Store Valby		GA	Brindley 7	Haldensleben 4	TRB-MES V Bernburg / Globular Amphorae	Late Wartberg	Late Neolithic	2900	
3000	MN III-IV	Bundse/Lindø		Boetholm	Brindley 6	Haldensleben 3				3000	
3100	MN II	Blandebjerg		Olderburg	Brindley 5	Haldensleben 2	TRB-MES IV Salzründe	Early Wartberg		3100	
3200	MN Ib	Klintebakke		Volkenwehe 2	Brindley 4	Haldensleben 1				3200	
3300	MN Ia	Troldbjerg			Brindley 3	Haldensleben 1	TRB-MES III Baalberge			3300	
3400	EN II	Fuchsberg	Fuchsberg/ Virum	Volkenwehe 1	Brindley 1/2	Düsedau 2				3400	
3500					Late Swifterbant/ Hazendank 3	Düsedau 1	TRB-MES II Baalberge	MK V	Younger Neolithic	3500	
3600	EN Ib	Oxie/ Velling	Oxie/ Svenstorp	Satrup/ Siggeneben-Süd		Lüdensen				3600	
3700										MK IV	3700
3800											3800
3900	EN Ia	Velling	Svalekint	Wangels/ Flintbek			TRB-MES I Spätengyel	MK III		3900	
4000					Middle Swifterbant					MK II	4000
4100	Final Mesolithic	Final Ertebølle					Gatersleben	MK I	4100		
4200									4200		

Abbreviations: LN late Neolithic - YN younger Neolithic - MN middle Neolithic - EN early Neolithic - LSG late Single Grave groups - MSG middle Single Grave groups - ESG early Single Grave groups - MK Michelsberg - TRB-MES Funnel Beaker Middle-Elbe-Saale. Shaded cells: central Funnel Beaker groups

FIG. 30.2. Schematic chronological table of Funnel Beaker and Single Grave development in south Scandinavia, the Northern European Plain and the Northern Lower Mountain Range (from Müller et al. 2010, fig. 1. Drawn by Ines

Early Neolithic (EN; 4100–3500 BC)

The earliest Neolithic pottery (Fig. 30.3) in northern Germany and southern Scandinavia is divided into different regional groups (early Neolithic Ia):

- Wangels/Flintbek (southern Jutland and north-eastern Germany, c. 4100–3800 BC), characterized by mostly undecorated simple funnel beakers and plates with some stitched or arcaded rim decoration or applied moulding below the rim;
- Volling group (northern and middle Jutland, c. 3900–3800 cal. BC), decorated with stab-and-drag stitches and other horizontal fields of lines on the rim—Funnel Beakers of Type B are also found;
- Svalekint group (Zealand and Scania, c. 3950–3800 cal. BC), with more stitches than in Volling but otherwise similar.

The most significant differences between these three groups are in shape and ornamentation. Whilst the southernmost ceramics of the TRB North Group is more or less undecorated, flat-based, and with some similarities to late Mesolithic ceramics (e.g. lamps), the northernmost ceramics are sometimes highly decorated with complex patterns, possibly derived from Scanian Ertebølle communities. However, Volling pots are round-based and the body has a globular shape, which is similar to western European pottery in northern France and Belgium (Klassen 2004, 189–203). Typologically, Volling pottery has at least some ‘alien’ types of decoration and pot shapes which might be comparable with western Chasséen and early Michelsberg pottery. Such connections are probably also represented in point-necked adzes, which are the earliest adzes of TRB in northern Europe. Beside these considerations a south/north trend in the distribution of TRB pottery is visible, as it appeared in northern Germany c. 4100 BC, 100–200 years earlier than in southern Scandinavia. These societies were characterized by small hamlets and temporary camps.

Around 3800 BC the constitution of these societies gradually changed with the construction of non-megalithic long barrows and the appearance of new pottery types (early Neolithic Ib).

- The Oxie group (concentrated in Zealand and Scania, but also a few sites in Jutland, c. 3800–3500 BC), without ornamentation all over, but sometimes with rim decorations like stitches on the outer rim. This assemblage of generally flat-based funnel beakers includes amphorae, flasks, and spoons. Whilst necks are usually not decorated, rims are ornamented with typical horizontal rows of short vertical lines or impressions (Madsen 1994, 231),

and applications of simple stitches and nail impressions on horizontal moulds are also known.

- The Siggeneben Süd/Stengade II group (northern Germany and Danish Isles, c. 3800–3600 BC) consists mostly of undecorated pots: funnel beakers with clearly distinguishable imported four-lugged amphorae from southern areas, and collared flasks. The slightly later Satrup group of northern Germany consists mainly of beakers and lugged beakers with vertical stripes on the belly.

The symbolic implications of a shift from highly decorated early Neolithic Ia pottery to mostly undecorated early Neolithic Ib pots has yet to be considered. The early Neolithic II pottery (c. 3500–3300 BC), associated not only with domestic structures or non-earthen long barrows, but also with causewayed enclosures and the first megaliths, began a new intensity of decoration which continued into the middle Neolithic (Fig. 30.3).

- Fuchsberg pottery in (northern Germany, most parts of Jutland, and the western Danish Isles) is characterized by flasks with elongated necks, funnel beakers with cylindrical to conical rims, and bowls which are in many cases completely ornamented with geometrical patterns (bands of chevrons, ladder-like vertical patterns, vertical stripes and plastic mouldings). Collared flasks are now highly elaborated and clay plates also decorated. Wolkenwehe 1 is a southern subgroup of Fuchsberg.
- The Virum group (Scania and Zealand, c. 3600–3400 BC) is characterized by funnel beakers with vertical stripes on the shoulder, lugged beakers, and lugged collared beakers (*Ösenkranzflaschen*).

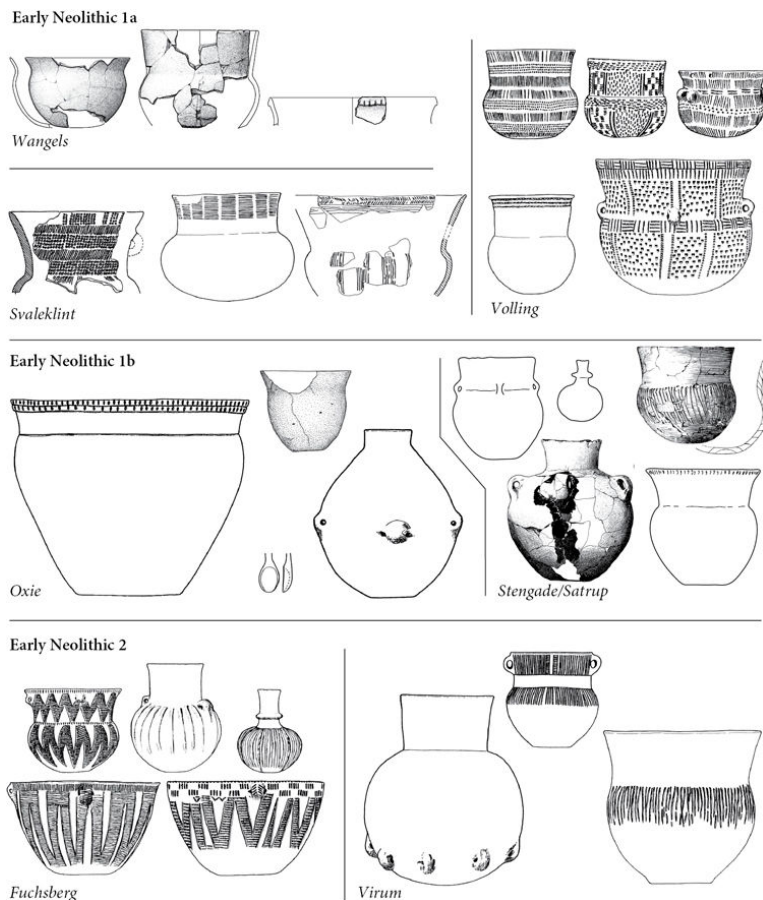


FIG. 30.3. Early Neolithic pottery. The differences between EN Ia, Ib, and EN II phases and different style groups are indicated (after [Grohmann 2010](#); [Schwabedissen 1979](#); [Midgley 1992](#). Drawn by Ines Reese).

Middle Neolithic (MN; 3300–2800 BC)

Middle Neolithic pottery ([Fig. 30.4](#)) coincides with the erection of megaliths (until c. 3100 BC) with its later forms giving way to early Corded Ware design.

- The MN Ia (c. 3300–3200 BC) is represented by Troldebjerg and Wolkenwehe 2 styles (domestic sites in Denmark and Schleswig-Holstein). Like Fuchsberg pots, they are often completely ornamented with ladders and bands of chevrons. Funnel Beakers possess a pronounced conical rim, and drums are known for the first time.
- MN Ib (c. 3200–3100 BC), named after the domestic sites of Klintebakke and Wolkenwehe 2, display similar shapes, but with more elaborate ornamentation with complex arrangements of bands, lines, and metopic patterns. Furthermore, the first three-limbed pots appear.

- MN II (c. 3100–3000 BC), named after the domestic sites of Blandebjerg and Oldenburg, is represented by three-limbed cups and jars, pedestalled bowls, and decorated clay discs. Ornamentation is fine, but not as dense as with MN I.
- These tendencies continue in MN III and MN IV (Bundsö and Lindö in southern Scandinavia and Bostholm in northern Germany, c. 3000–2900 BC). Decoration is simpler, mainly consisting of triangles or simple chevron stitches. Some pots are two-limbed rather than three-limbed.
- The MN V (Store Valby, c. 2900–2800 BC) is more or less equally distributed across the whole area. The ceramics are undecorated thick-walled barrel-like pots with only a few plastic applications, and simple conical beakers.

Whilst early Neolithic pottery indicates the regionalization of ceramic traditions over many centuries, middle Neolithic pottery reflects an intensification in ornamentation and thus a will to representation. The need to create new and more decorative signs on pots (and probably also on other parts of material culture) arguably indicates the growing importance of local and regional identities, and social differences within the communities. The range of fine ornamentation and vessel shapes comes to a peak around 3100 BC when megalith construction ends ([Klatt 2009](#)). Afterwards ceramic styles diversify but with a reduction in design variability, ending in a period of coarse and ‘ugly’ ceramics.

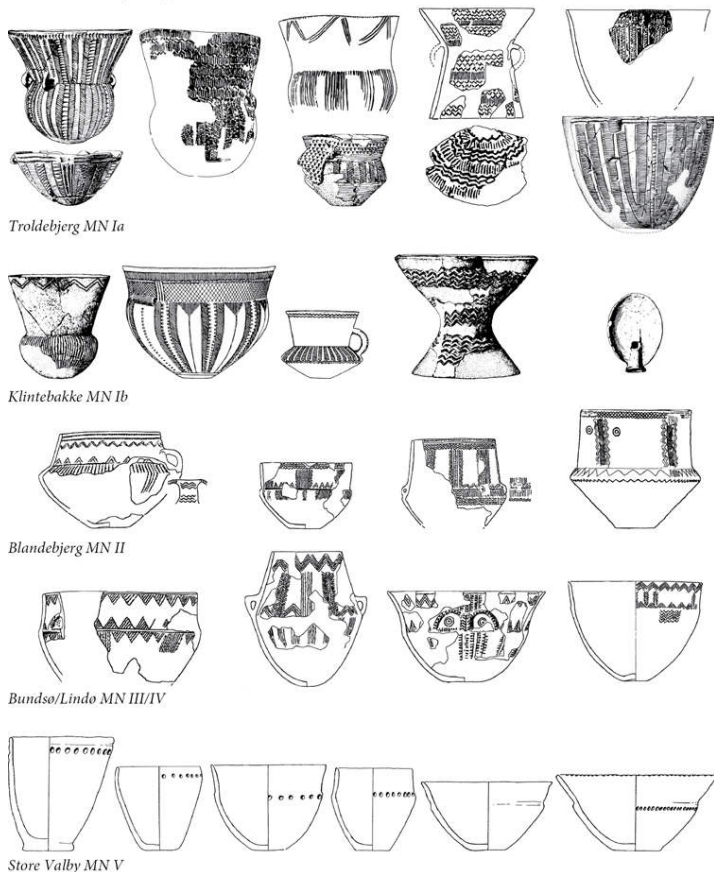


FIG. 30.4. Middle Neolithic pottery (after Schwabedissen 1979; Midgley 1992; Ebbesen 1975 and 1978; Madsen 1998. Drawn by Ines Reese).

Younger Neolithic (YN; 2800–2200 BC)

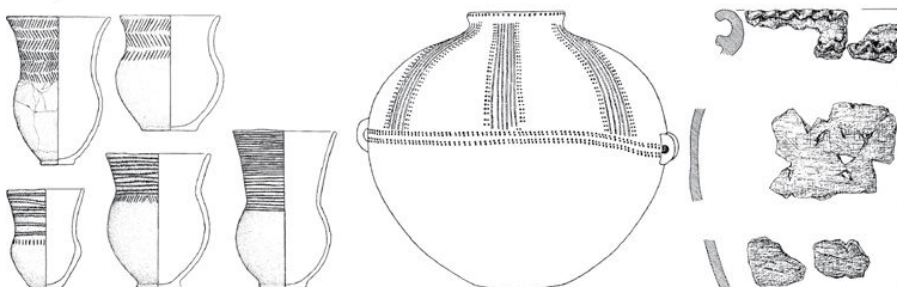
With the appearance of Single Grave culture (SGC) in southern Scandinavia and northern central Europe marked changes in pottery design are visible (Hübner 2005). After the twenty-ninth century BC the characteristic elements of material culture are flat-bottomed beakers with corded decoration, a significant new type without any typological link to late Funnel Beaker pots. Ceramics express a new social order despite the probability that the shift in material culture and burial rites is a result of autonomous changes, which used foreign innovations as a part of new designs. However, over the next six centuries further changes are detectable (Fig. 30.5).

- In the YN 1 (c. 2850–2600 BC) short decorated corded beakers with neck ornamentation and beakers with fishbone-like decoration are part of single

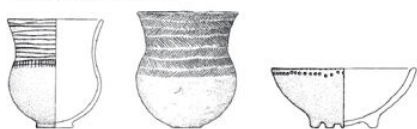
grave furniture. Amphorae with vertically stripped bellies (Strichbündelamphoren) and wavy-moulded ceramics (Wellenleistenkeramik), as well as finger dotted pots, are typical at domestic sites.

- In the YN 2 (c. 2600–2450 BC) S-profiled beakers with stroke ornaments and zone decoration are known beside footed basins and tulip-like pots.
- YN 3 (2450–2250 BC) burial ceramics consist of straight-walled or slightly inwardly curved beakers. Beakers with zone or ‘total’ (over-all) decoration are an addition to earliest Bell Beakers and footed basins. On domestic sites a shift from applied waved moulding to straight moulding is visible.

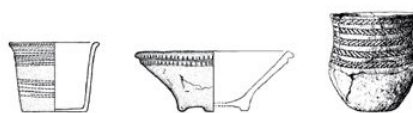
Younger Neolithic 1



Younger Neolithic 2



Younger Neolithic 3



Late Neolithic



FIG. 30.5. Younger and late Neolithic pottery (after [Hübner 2005](#); [Kühn 1979](#); [Saraau 2008](#). Drawn by Ines Reese).

Late Neolithic (LN; c. 2200–1700 BC)

The LN represents a continuation of Single Grave societies ([Vandkilde 1996](#); [Apel 2001](#)): beside the dagger replacing the axe in some male graves reflecting a general supra-regional pattern of change, all other changes in material culture could be explained as based on the younger Neolithic. In the late Neolithic 1 (2200–2000 BC), however, Bell Beakers play an important role in both domestic and burial sites of Denmark and northern Germany ([Saraau 2008](#)). All-Over-Ornamented Beakers, Grooved Beakers, and developed Bell Beakers are found beside undecorated beakers and bowls. In LN 2 (2000–1700

BC) the number of Bell Beakers decrease, along with the role of ceramics in burial contexts. Undecorated beakers and bowls now prevail ([Fig. 30.5](#)).

Complexity and diversity

Beside TRB pottery in south-eastern, middle, and northern Sweden, Pitted Ware pottery is of significant importance (GRK—Swedish Gropkeramisk Kultur). Pitted Ware is associated with sedentary foragers with farming influences, dating from 3500–2200 BC ([Larsson 2009](#); [Larsson 2006](#)). The pottery types are distinct from TRB or SGC, belonging to a different world of burials, deposition places, and domestic sites.

Summary

More than 2,000 years of Neolithic pottery in southern Scandinavia and northern central Europe saw many changes in the function and use of pots with clear differences between the early Neolithic I (4100–3500 BC), early Neolithic II (3500–3300 BC), middle Neolithic (3300–2800 BC), younger Neolithic (2800–2200 BC), and late Neolithic (2200–1700 BC). Differences between contexts clearly demonstrates the functional and semiotic use of pots as a means of communication. The creative, but also normative, sign system on pots express the local and regional identities both on utilitarian as well as non-utilitarian objects. That such patterns can be seen so clearly indicates the interconnectedness of economy and ideology in the production and consumption of pottery in these Neolithic societies ([Müller 2010, 2011b](#)).

THE SOCIAL AND CULTURAL DIMENSIONS OF CONTINENTAL NORTHERN EUROPEAN NEOLITHIC POTTERY

Production

Although the technology of production has been extensively studied (e.g. [Hulthen 1977](#); [Koch 1998](#)), no sites of production and firing have yet been discovered. It is assumed that southern Scandinavian pottery was produced as a local, home-made ceramic. There are no visible regional patterns in the technologies used in producing ceramics (e.g.

the use of temper, the temperature of firing, and the work on ceramic surfaces). In consequence, differences or similarities in ceramic design may indicate the relational *habitus* shared by or distinguishing social units as households or small groups producing pottery.

Distribution

Neolithic ceramics were produced locally; regional and supra-regional exchange has never been proven. In consequence, similarities in shape and ornamentation result from functional similarities and shared culturally defined sign systems. Thus, distribution patterns indicate the strength of communication between people rather than the exchange of ceramics as commodities. In this respect Neolithic ceramics in the Northern European Plain and southern Scandinavia are a useful proxy for identifying spatial communication patterns and places of dense cultural interaction (Fig. 30.6).

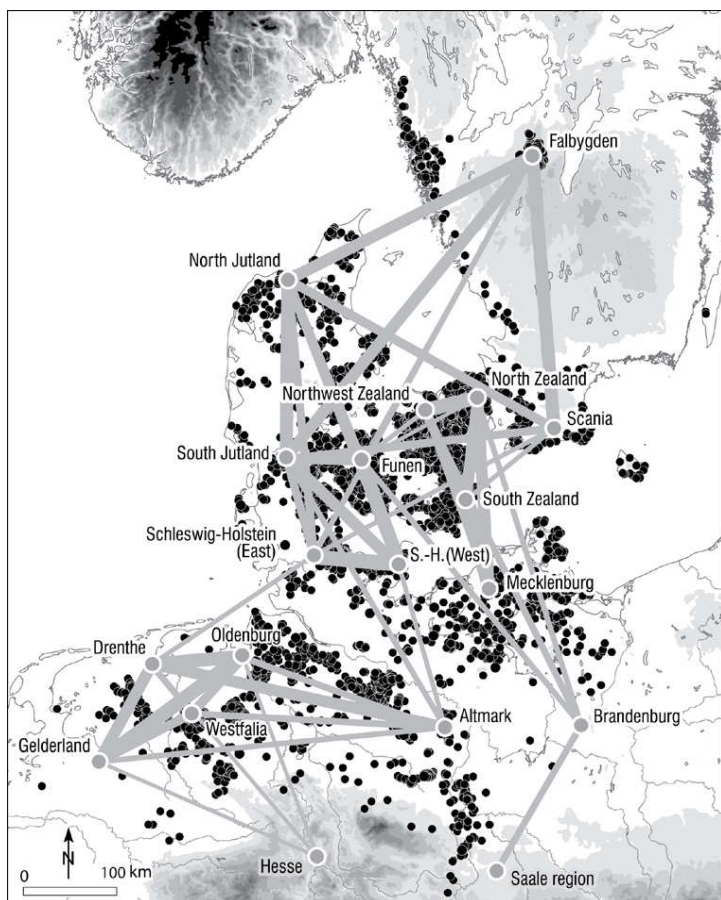


FIG. 30.6. Spatial communication patterns indicated by ceramic design. The

results of a network analysis of different TRB regions indicates similarities and distances between these groups (after [Furholt 2012](#)).

Consumption

The reconstruction of consumption patterns is based not only on the reconstruction of ceramic design but also on depositional processes, which are associated with different categories of archaeological sites at different times. Whilst evidence from the late Neolithic is too scarce to come up with conclusions about consumption practices, much more can be said about the TRB and SGC periods.

During the TRB it is possible to reconstruct patterns of household and burial deposition which suggest ceramic types were often specially selected for specific purposes in certain quantities. More or less all known ceramic shapes and ornaments occur at houses or small hamlets: coarse ware was used for cooking and storing, whilst middle fine and fine ceramics were used decoratively for communication during eating. During the early Neolithic Ia there was no clear differentiation in the use of decorative patterns or pot shapes between graves and domestic sites. The same is true for the early Neolithic II, where domestic sites, causewayed enclosures, and burials again have similar decoration and pottery shapes within their assemblages. In contrast, during the middle Neolithic both domestic sites and re-used causewayed enclosures produce similar ceramic types, but single burials yield mostly undecorated pottery, whilst deposits and offerings in front of megaliths are carried out with highly decorated pots. Decorative differences probably reflect different spheres of activity, partly also displayed in the coarse/fine ware contrast.

Alongside differences in the composition of ceramic assemblages, different depositional processes are also evident during the TRB. Whilst on domestic sites habitation debris usually includes most parts of the broken pots, the deposition of pots at both burials and causewayed enclosures often follows a pattern of deliberate destruction. A funnel beaker was broken in the gateway of an enclosure at Albersdorf-Diesknöll and the sherds then deposited in both ditch terminals ([Müller 2011b](#)). In front of many Scandinavian passage graves large numbers of pots were broken and deposited over many generations ([Fig. 30.7](#); [Tilley 1996](#)). At causewayed enclosures often only one quarter of each original pot was deposited (what happened to the remainder?), leaving a relatively low density of ceramics compared to domestic sites. The acts of consumption which took place here were periodic and limited to cooperative feasting activities. Causewayed enclosures are the only archaeological remains which indicate communal interaction among those living in scattered

new local and regional identities (Müller 2011b). The intensification of ceramic production and the increasing variation in ceramic ornamentation (starting with the first construction of megaliths and enclosures) at this time marks a new dynamic lasting for about 300 years: a dynamic in which special pots played an active role in communication between individuals and groups in both profane and ritual situations. Later, as these ceramic designs became more localized, monument construction ceased. During this period, when there was also decreased ceramic production and a move away from decoration, a new style of pottery, the corded beaker, accompanied further ideological change. For the first time the intensification of ceramic ornamentation goes hand in hand with increasing regionalization, resulting in diverse late Single Grave culture groups. This period is again followed by a time in which not much effort was put into ceramics so that it probably did not play an important role in the link between material culture and social groups. Variations in decoration and shape therefore seem to go hand in hand with social developments as seen through other media.

Great Britain and Ireland

RICK PETERSON

THE ORIGINS OF POTTERY IN BRITAIN AND IRELAND

Pottery in Ireland and Britain is a late phenomenon by continental European standards. In common with other cultural traits associated with the Neolithic period there is no convincing evidence for pottery production and use before around 4000 BC. This is not the place to consider the mechanisms by which Neolithic practices reached the islands, there being a lively and ongoing debate on the subject (Thomas 1988; Armit and Findlayson 1992; Thomas 1999; Thomas 2003; Sheridan 2003; Sheridan 2004). In the specific case of Neolithic ceramics, a degree of contact with pottery using communities elsewhere must be assumed; however, unambiguous and well-dated precursors for British and Irish material have been difficult to trace (Cleal 2004, 183; Louwe-Kooijmans 2005). A fruitful focus of debate has been how the knowledge of pottery making and use can be transmitted. Cleal (2004, 185) suggested that individual mentoring and tuition was the most plausible mechanism for transmitting craft knowledge in small-scale societies. The question of what individual traditions and practices made up the work of the Neolithic potter will

form the core of this contribution.



FIG. 30.8. Find spots for pottery assemblages discussed in this section.

REGIONAL AND CHRONOLOGICAL FRAMEWORKS

Since [Ian Kinnes' \(1988\)](#) work on the beginning of the Neolithic and [Herne's \(1988\)](#) work on the reliability of dates associated with the first Neolithic pottery it is now clear that none of the material from Britain or Ireland should be dated before c. 4000 BC. Similar studies over the last 20 years have helped refine and focus the chronology of pottery manufacture and use throughout the Neolithic ([Gibson and Kinnes 1997](#); [Cleal and MacSween 1999](#); [Cowie 1993](#); [Sheridan 1995](#); [Sheridan 1997](#); [Peterson 2003](#); [Cleal 2004](#)). Obviously these chronologies are regionally specific but broader trends and changes can be identified. In particular, [Cleal \(2004, 180–181\)](#) has set out the aim of developing a 'ceramic-friendly' chronology for the Neolithic. In

this section a synthesis of recent work on these chronologies has been attempted to create a fourfold chronology for Ireland and Britain as a whole.

First Neolithic

In his highly influential 1988 paper Andrew Herne refined [Smith's \(1974\)](#) Grimston/Lyles Hill series to define the open carinated bowl as a unitary style of pottery belonging right at the beginning of the Neolithic. Although pottery of this style clearly is early at many sites, [Cleal \(2004\)](#) has questioned whether it is quite as unitary a phenomenon as Herne suggests. She identifies securely dated early assemblages which include a wider range of forms ([Cleal 2004](#), 178–80). Similarly, although [Sheridan \(1995, 1997\)](#) has identified a clear horizon of open carinated bowls as the first Neolithic pottery in both Ireland and western Scotland, she also points to examples of a more varied repertoire of shapes from sites with early dates ([Sheridan 1995](#), 17; [1997](#), 218–9). The debate is largely concerned with how much variation to allow within the overall category of the open-profiled carinated bowl. Despite these reservations, the broader idea that early pottery in Ireland and Britain tends to be in one of a small range of restricted forms still seems to be useful. Dates for this first part of the Neolithic have been variously suggested as 3950–3800 BC for Irish pottery ([Sheridan 1995](#), 17), 4000–3800 cal. BC for Wales ([Peterson 2003](#), 133), and 4100–3850 cal. BC for southern and western England ([Cleal 2004](#), 181); more generally this material belongs to the two centuries after 4000 BC (e.g. [Sheridan 1997](#), 219; [Cowie 1993](#), 19).

Early Neolithic

All these studies also identify material from the early Neolithic which falls outside the very earliest phases and which can be variously considered as ‘modified’ or ‘developed’ variants of the bowl tradition. [Herne \(1988](#), 15) distinguished the less open carinated forms with more complex rims from sites such as Broome Heath as ‘shouldered bowls’ forming a distinct and slightly later tradition to his open carinated bowl pottery. The strict chronological distinction at all sites has been rightly scrutinized by [Cleal \(2004\)](#) but all of the studies already cited include an element of a wider range of vessel forms and, in some regional cases, decoration dating to the later part of the early Neolithic. A consensus is emerging that the chronological division between a first and early Neolithic is valid, at least for pottery. [Cleal \(2004](#), 181–2) further sub-divides the period in southern England into

two phases—‘Early or Developing Neolithic’, c. 3850–3650 BC, and ‘High or Developed Neolithic’, c. 3650–3350 BC. In eastern and central Scotland, [Cowie \(1993, 19\)](#) points to the development of his class of ‘heavy bowls’ alongside early decorated pottery in the mid to late fourth millennium BC. Further west, recent studies by [Sheridan \(2000, 2003\)](#) include a series of early Neolithic developments in both Ireland and western Scotland dating between 3750 and 3500 BC. A similar early Neolithic phase, c. 3800 to 3400 BC, has been suggested for Welsh pottery ([Peterson 2003, 133](#)).

Middle Neolithic

In Ireland ceramics are marked by a series of regional sub-styles and modified forms developing after 3600 BC ([Sheridan 1995, 18](#)). In Britain the important transition is the development of the broad Impressed Ware tradition, incorporating the Ebbsfleet, Mortlake, and Fengate sub-styles of Peterborough Ware in the south and east with other regional groupings further north. Since the review of radiocarbon dates by [Gibson and Kinnes \(1997\)](#) it is clear that the Peterborough styles at least begin around 3400 BC and that there is no chronological significance to the sub-styles. Similar conclusions were reached for Welsh Peterborough Ware by [Gibson \(1995, 30\)](#), with all pottery dating 3500–2500 BC. In central and eastern Scotland Impressed Ware dates tend to cluster in the earlier part of the third millennium ([Cowie 1993, 21](#)). In the west of Scotland [Sheridan \(2000\)](#) has suggested dates between 3500 and 3000 BC for Hebridean Wares, with Orcadian Unstan Bowls and the Collared Bowls of the south-west belonging between 3500 and 3250 BC.

Late Neolithic

The late Neolithic is dated by the introduction of Grooved Ware. This did not take place at the same time in all parts of Britain and Ireland, and the relative importance of Grooved Ware assemblages varies from region to region. Key work on the dating of British Grooved Ware by [Brindley \(1999b\)](#) and [Garwood \(1999\)](#) puts the style as a whole between 2900 and 2100 BC. It is also now clear that Grooved Ware has its origins in northern Scotland ([Garwood 1999, 146](#)), probably deriving from the middle Neolithic Unstan Ware of the Orkney Islands. Grooved Ware in Ireland has only been identified relatively recently ([Brindley 1999a](#)); here it is a relatively rare component alongside the continued use of modified bowl pottery and was probably introduced around 2900–2700 BC.

Summary

Over the whole of Ireland and Britain it would seem sensible to discuss pottery developments using the following four-phase framework: first Neolithic 4000–3800 BC; early Neolithic 3800–3500 BC; middle Neolithic 3500–2900 BC; and late Neolithic 2900–2400 BC. Although these phases are averages of regionally specific events and changes they should give a dated structure for major changes in the way people made and used pottery. The following two sections discuss the surviving evidence for the manufacture and use of pottery using this chronology (see [Fig. 30.8](#)).

PRACTICE AND MATERIALITY

Pottery, like all artefacts, arises out of the application of knowledge and decisions. We recognize and reify the results of these decisions as our named styles of pottery but it is likely that categories of practice and material engagement in the prehistoric past were both more fluid and less conscious than this. The following section reviews the evidence looking primarily at how people worked with clay and used pottery.

Unfortunately, clay is such a plastic material that unambiguous traces of specific practices can often be obscured. This has particular relevance for debates about the transmission of pottery-making knowledge. Attempts have been made in lithic studies to identify assemblages characteristic of the process of learning knapping ([Finlay 1997](#); [Pigeot 1990](#)). Nothing similar can be attempted with ceramic assemblages. If pottery seems to us ‘crude’, ‘experimental’, or ‘unskilled’ we must remember that it was nonetheless chosen for firing and use in the Neolithic: the place for unsuccessful experiments would have been the reclaim bin—or at least its prehistoric equivalent—rather than any context which might preserve them for our study. Similarly, we should not be surprised at a high degree of technical competence in the earliest surviving pottery.

There is extensive ethnographic literature describing how pottery has been made and used in traditional societies around the world (e.g. [Van der Leeuw and Pritchard 1984](#); [Rice 1987](#)). Taken in conjunction with detailed technical analysis of Neolithic ceramics (e.g. [Darvill 1984](#); [Jones 1999](#)), it is possible to use this to suggest traditions of manufacture and use and to try and ascribe dates to them.

Clay and inclusions

A source of workable clay is a fundamental requirement for all potters. Ethnographic surveys ([Arnold 1981](#), 35) suggest that most modern potters seek clay within a single day's travel of the production site, although [Rice \(1987, 117\)](#) points to a much wider variety of practices. Depending on the geochemical properties of the source the clay may then need to be modified by processes such as levigation (mixing clay with water to allow impurities to settle out), souring (storing wet clay to allow water permeation and bacterial action to increase the plasticity), wedging (kneading the clay to homogenize it and remove air pockets), and mixing with other clays. Many modern potters add inert material (temper) to their clay (see [Rice 1987](#), 118–24, for a survey of varying examples). This tends to have two functions: it aids the firing of the clay, promoting a variety of chemical reactions during the firing process (see [Rice 1987](#), 93–8 for a summary) and greatly increases the chance of a pot surviving the firing; and, depending on their properties and size, inert inclusions can modify the physical properties of the finished vessel, making it either more robust or better able to withstand the stresses of heating and cooling (see [Steponaitis 1984](#), 85–108, for a detailed technical discussion of these effects). All of these processes can potentially leave traces in the body of the finished pot which can be detected, particularly through the use of thin section slides (see [Peacock 1970](#) for a review of methodologies). Historically, thin section data has tended to be used as a tool for sourcing pottery production (see [Riley 1984](#) for a review). Studies also exist which allow us to see the way clays and inclusions from different areas were chosen and blended in the same assemblage; a good example being analysis on the pottery from Trefignath chambered cairn on Anglesey ([Williams and Jenkins 2005](#)).

Manufacture and firing

Ethnographic examples of known techniques for hand-building pottery are surveyed by [Rice \(1987, 124–8\)](#). Very detailed formal accounts of specific hand-building traditions are presented by [Krause \(1984\)](#) and [Van der Leeuw \(1984\)](#). It is very difficult to be sure exactly how people built pottery in the Neolithic: an expert hand potter can, if they desire, almost completely remove all traces of the processes used to form a vessel. Fortunately, some data do survive within vessel walls from most British Neolithic assemblages. This usually takes the form of voids left by the incomplete joining of one segment of the pot to another (see [Fig. 30.9](#)). [Woods \(1989, 196–200\)](#), reviewing this evidence, suggests that the dominant way of working was to build vessels from cylindrical straps of clay rather than the annular rings

favoured by modern craft potters.



FIG. 30.9. Cross-sectional views of Neolithic pottery from Blasthill chambered cairn, Argyll, showing voids and breaks in the fabric along the joins between segments.

For pottery to be any use it must be fired. No well-defined Neolithic pottery production sites have yet been found, and very few assemblages have traces of production evidence—the kneaded but unshaped clay noted from Biggar Common West, South Lanarkshire ([Sheridan 1997, 202](#)) is one example. Generally, only the data from the pottery itself tell us about firing practices. It is clear from the absence of even simple kiln-type structures that all firings were a variant on the simple bonfire and a wide range of experimental work has been carried out illustrating its effectiveness (e.g. [Woods 1989](#)). Clays pass through two chemical changes in the temperature range we might expect for open fires: dehydration and oxidization. Dehydration of the clay minerals occurs as they are converted from hydrous and hydrated forms of aluminium silicate to anhydrous forms. The clay loses its plasticity as the crystalline structure of the clay minerals breaks down and particles are no longer free to move against one another. Iron and carbon compounds are also present in clays as impurities. Oxidization of the carbon compounds takes place at lower temperatures than of the iron compounds and it is the incomplete

removal of this carbon which give the characteristic dark core to partially oxidized sherds (Shepard 1968, 20–21). Carbon oxidation depends on fabric porosity, kiln atmosphere, firing temperature, firing duration, and the rate of temperature increase. The last of these can be disregarded here since open bonfires produce similarly rapid rates of temperature increase (Shepard 1968, 74–91). Fabric porosity is difficult to measure except by techniques which would be destructive to prehistoric ceramics (Shepard 1968, 127). The temperature reached during firing can be partly inferred from physical changes in clays and some inclusions, particularly if thin-section data are available (Peacock 1977, 30; Steponaitis 1984, 83; Tite 1972, 230). Kiln atmosphere and firing duration both depend on the type and amount of fuel used (Hodges 1962, 63; Rye 1981, 102; Shepard 1968, 79–84 document extensive experimental work on the effects of these choices), but also on whether or not a pit is used for the firing. Therefore, using the data available from assemblages studied in detail, it ought to be possible to make broad inferences about different firing techniques; particularly where thin section analysis has been carried out (for example the analysis by Smith and Darvill (1990, 151) of pottery from Hazleton North).

Use

The past uses of archaeological ceramics can be analysed through a range of well-established techniques which work best where vessels have consistently been used for similar tasks. At a very simple level is the recording of fire traces on the exterior of vessels used for cooking, creating a paler and often pitted surface on the base of a pot used in this way (Fig. 30.10). It is possible to identify vessels with this secondary oxidization and only slight sooting on the upper walls; these would have been habitually used for cooking by placing the base directly on a bed of embers. Other vessels display a different pattern of intense sooting of the base and little or no secondary oxidization; this implies these vessels were usually suspended above the fire during cooking (Rice 1987, 235). Remarkably few Irish and British Neolithic vessels show no traces of cooking at all.

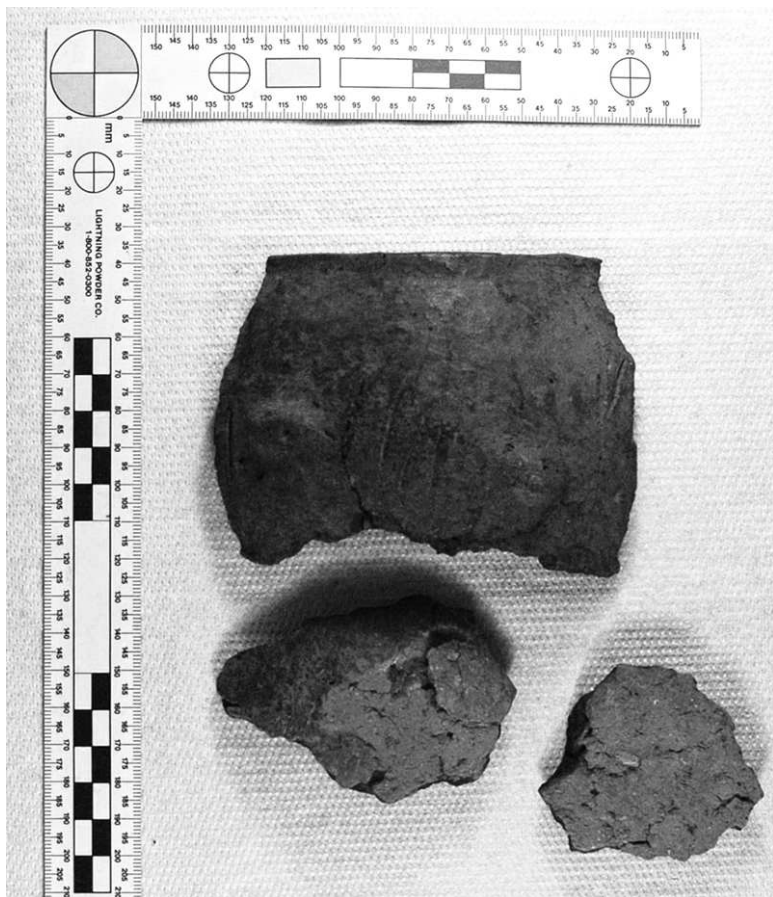


FIG. 30.10. Base and wall sherds of a complete Neolithic vessel from Blasthill, Argyll, showing secondary oxidation of the base and sooting on the walls. This vessel was placed directly on a bed of embers as a cooking pot.

Charred food remains survive in a surprisingly high proportion of Neolithic pottery but the most successful analytical technique for studying the use of pottery has been gas chromatography of food lipids which have become chemically bonded with the clay (see [Evershed et al. 1992](#) for a review of methodologies). This has been used both to demonstrate consistent links between different vessel types and different foodstuffs ([Jones 1999](#)), and to document changing diets over a longer time period ([Dudd and Evershed 1999](#)). It is also possible to make broad statements about potential vessel use from the known physical characteristics of the fabric ([Steponaitis 1984](#), 95–116). Of particular relevance are the mechanical strength of sherds and the ability of the pot to withstand thermal shock and stress. A study of this kind by the author established that these categories did not appear to limit the use of Neolithic pottery for cooking, although they may influence the kind of cooking that is possible ([Peterson](#)

MEANING AND ASSOCIATIONS

The first Neolithic pottery

During the first part of the Neolithic it could be suggested that pottery production was strongly bound by rules and procedures. This can be most clearly seen in the relatively restricted range of vessel shapes and the absence of decoration in most assemblages (see [Fig. 30.11](#)). By contrast, where we have thin-section data from dated assemblages, there is a tendency for clay and inclusion ‘recipes’ to be complex—as at Trefignath, Anglesey, for example ([Smith and Lynch 1987](#); [Peterson 2003](#), 52–4). This complexity seems to be both within particular assemblages and across regions. Clay and inclusion choices are much more complicated than the minimum technical requirements to successfully fire and use pottery.

Despite the ‘fine’ character of much of this early pottery it appears to have been used for cooking. Although [Herne \(1988, 26\)](#) describes it as having a special character and role on the basis of his survey of British and Irish material, he also concedes that this was probably bound up with its primary function as a new technology of food preparation. Certainly large assemblages with early dates, such as from Biggar Common West, South Lanarkshire ([Sheridan 1997, 204](#)), show clear evidence of use for cooking on open fires.

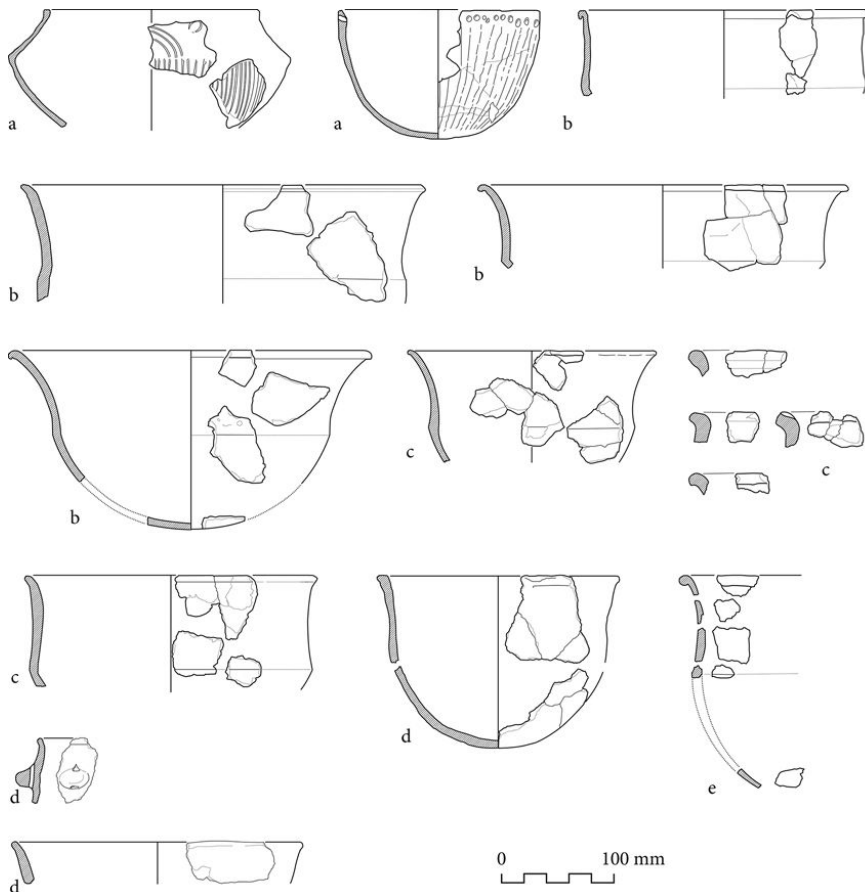


FIG. 30.11. Selected dated material belonging to the first Neolithic: (a) Ballymacaldrack, Antrim (after Herity 1982); (b) Biggar Common West (after Sheridan 1997); (c) Gwernvale (after Britnell and Savory 1984); (d) Flagstones (after Cleal 1997); (e) Tankardstown South (after Sheridan 1995).

Developing variability

By the later part of the early Neolithic these clay and inclusion recipes seem to have become slightly more standardized. However, unusual tempering materials such as the burnt bone found in vessel 32 from Hazleton North, Gloucestershire (Smith and Darvill 1990, 152) also seem to belong to this period. Forms remained relatively standardized but in particular regions decorated assemblages developed (Fig. 30.12). Although Herne's (1988) model would see variability developing from a standardized 'carinated bowl' at about this date in some areas (Wales for example; see Peterson 2003, 152) the range of vessel forms actually narrows. Analysis of the potential and actual uses of early Neolithic pottery from Hazleton North by Smith and

Darvill (1990, 151) seems to show distinct classes of cooking and storage jars in the assemblage.

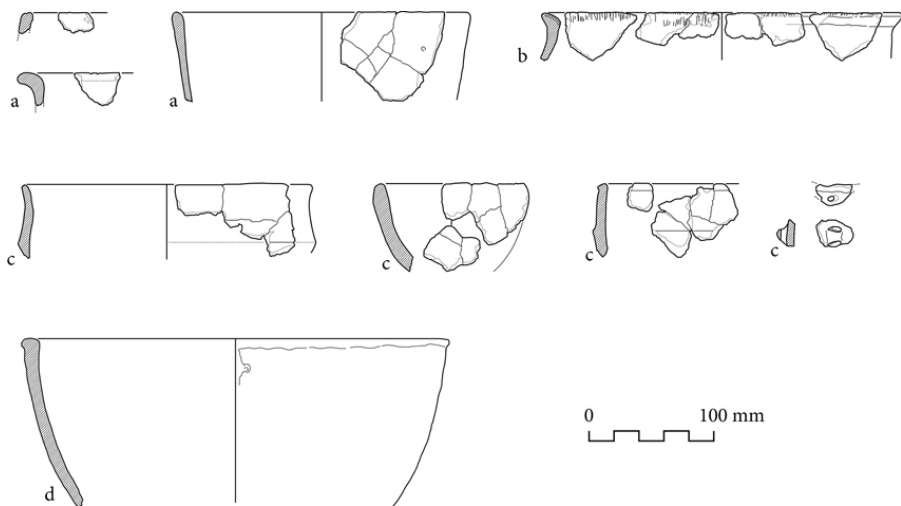


FIG. 30.12. Selected dated material belonging to the early Neolithic: (a) Gwernvale (after Britnell and Savory 1984); (b) Hazleton North (after Smith and Darvill 1990); (c) Pitnacree (after Cowie 1993); (d) Windmill Hill (after Zienkiewicz and Hamilton 1999).

Impressed Wares

By the middle Neolithic it seems as if traditions of pottery production had undergone a major change. Now the emphasis was on a wide variability in vessel form, especially in the areas outside the distribution of the Peterborough sub-styles (Fig. 30.13), allied with a profusion of new decorative techniques common to all the Impressed Ware traditions. The other major change at this date was in the inclusions used. Impressed Ware assemblages, despite the variability in form and decoration they display, tend to be tempered with locally available materials. This temper is usually processed in a very perfunctory way, leading to substantial chunks of rock inclusions such as quartz being present in much pottery of this date; see for example the large Mortlake Ware assemblage from Ogmores-by-Sea, Glamorgan (Gibson 2001).

A much more detailed understanding of the use of middle Neolithic pottery was possible from organic residue analysis carried out at Upper Ninepence (Dudd and Evershed 1999). These vessels had clearly been used for cooking meat, primarily from cattle and sheep. Similar analysis on an Unstan ware assemblage from Stonehall, Orkney (Jones 1999, 63) demonstrated that the pottery had been used for cooking both cattle meat and milk.

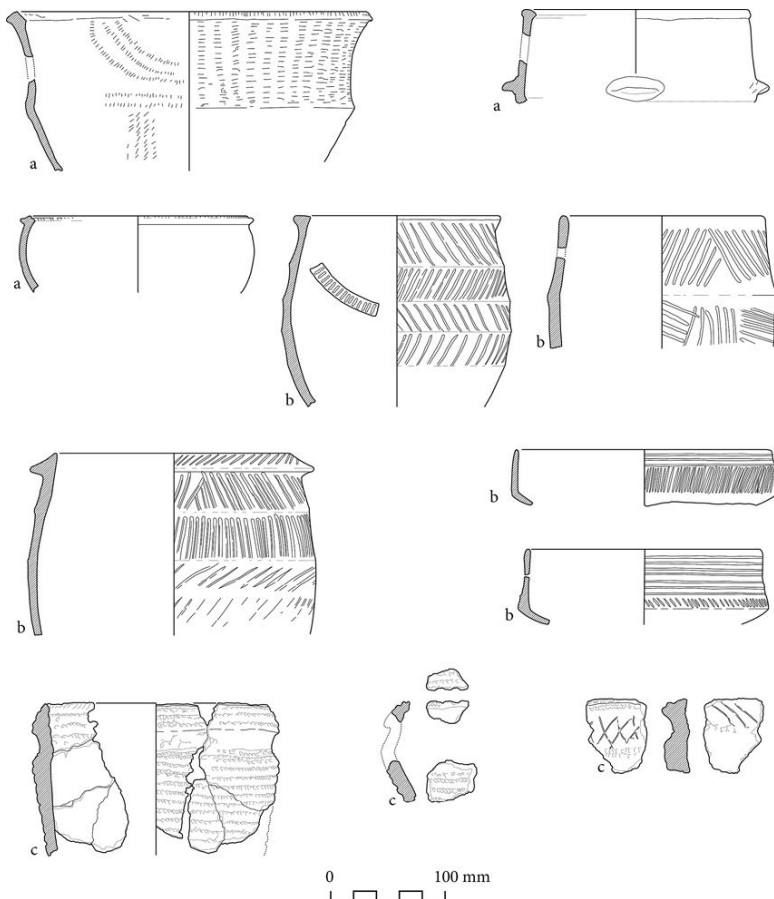


FIG. 30.13. Selected dated material belonging to the middle Neolithic: (a) Goodland (after [Sheridan 1995](#)); (b) Northton, Harris (after [Murphy and Simpson 2003](#), fig. 11,4); (c) Ogmores-by-Sea, Glamorgan (after [Gibson 2001](#), fig. 6).

Grooved Ware

By the late Neolithic this utilitarian approach to pottery temper seems to have been further simplified by the widespread introduction of grog tempering. We must be careful not to overstate the absence of grog in earlier periods as where we have thin-section data grog appears to be a part of even the very complex tempering strategies of the first and early Neolithics ([Darvill 2004](#), 194). However, by the late Neolithic we see assemblages primarily tempered with grog or with single stone types, such as the assemblage from Links of Noltland, Orkney ([Sheridan 1999](#), 116). Whilst vessel form and decoration shows a similarly wide range of possibilities as in the middle Neolithic, there is much more sense of these choices being widely disseminated and

understood over large areas. This is reflected in the established Grooved Ware sub-styles which cover the whole of the study area (Fig. 30.14). Organic residue studies have established a range of potential uses for Grooved Ware pottery. From Barnhouse, Orkney, there is evidence for the cooking of beef, milk and barley (Jones 1999, 64), whereas at Upper Ninepence the pottery seems to have been for cooking pork (Dudd and Evershed 1999, 117). Charred remains and pollen within Grooved Ware at Balfarg indicate cereals, potherbs, and some more exotic and potentially potent plants such as nightshades and *Solanaceae* (Moffat in Barclay and Russell-White 1993, 109).

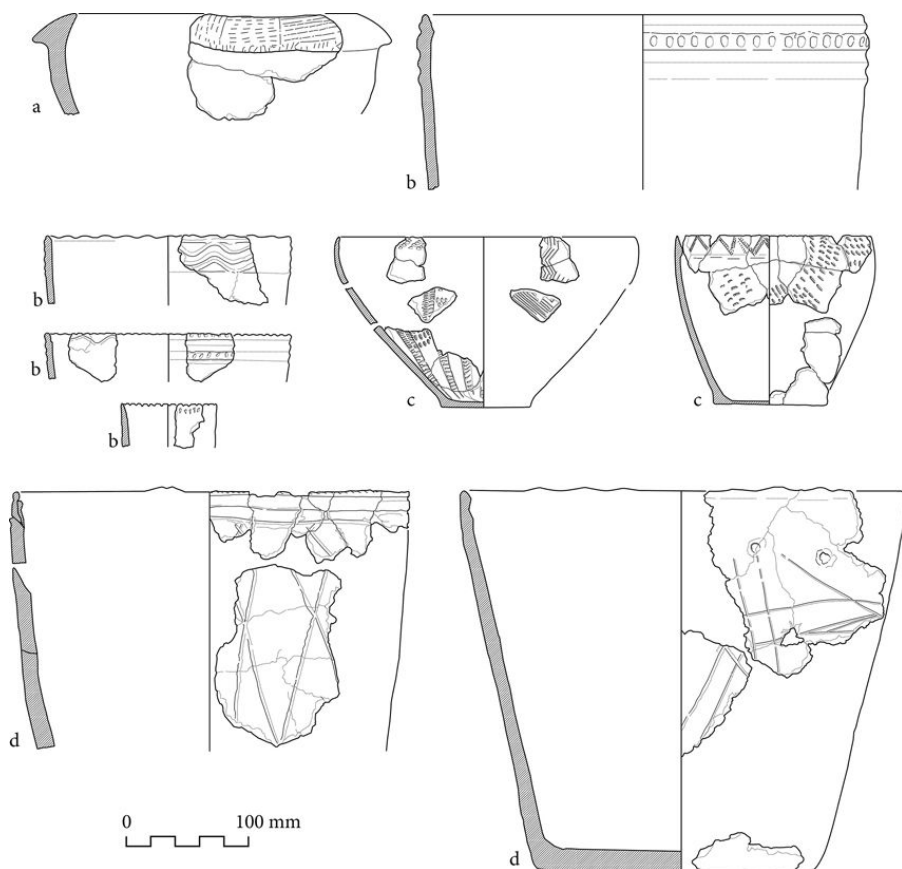


FIG. 30.14. Grooved Ware and other late Neolithic pottery: (a) Lambay Island (after Sheridan 1995); (b) Links of Noltland (after Sheridan 1999); (c) Upper Ninepence (after Gibson 1999); (d) Balfarg Riding School (after Barclay and Russell-White 1993).

CONCLUSIONS

In summary we can see Neolithic pottery in Ireland and Britain as a

technology made up of a number of traditions and practices. The shape of vessels seems to be strongly codified in the first instance, although the range of different inclusion recipes would suggest an experimental radiation of practices. In the middle and later Neolithic we can suggest there was a simplification of the technical aspects of potting alongside a radiation in the range of shapes and uses that were thought appropriate.

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CHAPTER 31

BELL BEAKER POTTERY AND SOCIETY

MARC VANDER LINDEN

INTRODUCTION: FOLK OR ÉLITES, CULTURE OR PHENOMENON?

DURING the second half of the third millennium BC, people scattered throughout Europe made, used and disposed the same pots, known as Bell Beakers.¹ This label refers to ceramic vases with an S-shaped profile and a distinctive decoration organized in horizontal bands of repeated motifs. The same people also used other artefacts on a regular, but not systematic, basis, namely stone bracers, daggers with triangular blade, or various types of arrowheads. However, even for such a restricted class of artefacts, the various archaeological assemblages present an impressive variability, rendering any material definition of a coherent Bell Beaker material culture an arduous task. Things become even more difficult when taking into consideration other categories of evidence (e.g. funerary practices, settlement patterns, metallurgy). This messy situation has been increasingly acknowledged by scholars over the past two decades, and most now prefer the expression Bell Beaker Phenomenon (hereafter BBP), a term as vague as the processes it is supposed to document. Comparative research is also difficult, as the BBP falls variously in the late Neolithic, the Chalcolithic, or the early Bronze Age, depending on the chronological scheme prevalent in a given region.

Culture-historical accounts championed the idea of a unique, coherent historical event expressed by a pan-European material culture which traced the spread of the ‘Beaker folk’ across the continent. Childe suggested that the incentive behind the travels of the ‘Bell Beaker people’ was copper prospecting (Childe 1925). David Clarke identified types of Beakers, associating each with a specific putative continental origin and wave of migrants (e.g. North British/North Rhine, North British/Western Rhine groups: Clarke 1970), whilst Sangmeister’s *Rückstrom* theory accounted for the material divergences and similarities between the Iberian Peninsula and central

Europe in terms of a population oscillating back and forth between these regions ([Sangmeister 1966](#)). The wide variation in Bell Beaker assemblages and in cultural practices at sites with Bell Beakers fuelled a processual critique of culture-historic perspectives in the late 1970s. Stephen Shennan showed that Bell Beaker finds in central Europe did not meet the methodological requirements of the classical archaeological culture ([Shennan 1978](#)): the sole recurrent coherence he could observe was confined to a restricted number of artefacts in graves, which he grouped together as a package (in particular Bell Beakers, daggers, stone bracers: [Shennan 1976](#)). Because this package only occurred in funerary contexts, Shennan postulated a specific social function: Bell Beakers were prestige goods, circulating amongst emerging élites. Shennan's package ignored the wider range of material culture associated with Bell Beakers across Europe, because that range varied from place to place. He denied the existence of the Beaker folk and pointed to a different social phenomenon, linking a handful of chiefs in the making ([Shennan 1976](#); see also [Clarke 1976](#)). Although this model was initially devised in local—central European—terms, it quickly became the leading explanation for the entire BBP (e.g. [Guilaine 1984](#)). Over the past 15 years, the wide and uncritical acceptance of this model and its numerous versions (see [Brodie 1994, 1997](#)) led to a growing dissatisfaction and a noticeable revival of research, first and foremost amongst continental archaeologists grouped in the Archéologie et Gobelets association (e.g. [Benz and van Willingen 1998](#); [Czebreszuk and Szmyt 2003](#); [Czebreszuk 2004](#)). This process also gained momentum thanks to some formidable finds, especially the 'Amesbury archer' ([Fitzpatrick 2011](#)). As a result, there have been some major publications (e.g. [Strahm 1995](#); [Salanova 2000](#); [Heyd 2000](#); [Nicolis 2001a](#); [Besse 2003](#); [Vander Linden 2006](#)), and numerous ambitious research projects are currently in process. All in all, we now have a better knowledge than ever of the regional idiosyncrasies, and clear evidence for connections between these different regions: the question now concerns the nature of those relationships.

THE BELL BEAKER ARCHIPELAGO

As shown in [Fig. 31.1](#), the BBP presents a particular geographic patterning, best described as an archipelago, a suite of islands scattered from the southern Baltic Sea to both sides of the Gibraltar strait, and from the Irish Atlantic coast to the Carpathian basin. The 'blank areas' correspond to communities using other material cultures who may have explicitly rejected Bell Beaker-related items, although

they sometimes share other material traits with regional Bell Beaker groups (Vander Linden 2006). The ‘islands’ of Bell Beaker activity cluster along major rivers and coastlines. In north-western and central Europe, these are scattered along the Rhine–Danube axis, starting with the Dutch group in the lower Rhine and the northern Low Countries (Drenth and Hogestijn 2001; Lanting 2007–8) then, following the Rhine upstream, a group in the French Moselle (Lefebvre et al. 2008) and several groups in Germany (Heyd 2000, 2007), Austria (Neugebauer and Neugebauer-Maresch 2001), the Czech Republic (Turek et al. 2003), and western Slovakia (Bátora et al. 2003). In Poland there are ‘islands’ in the lower Oder and the Vistula basins as well as the south (Czebreszuk 1998). In southern Scandinavia, Bell Beaker finds, mostly in settlements, are concentrated in Jutland, with occasional discoveries in Norway and Sweden (Vandkilde 2005; Sarauw 2007). As summarized for central Europe by Heyd (2000, 2007), and for Denmark by Sarauw (2007), these Bell Beaker groups all present complex interactions with neighbouring contemporary Corded Ware communities, although Lanting has questioned the precise duration of these contacts (Lanting 2007–8). Further east, the BBP is known in central Hungary as the Csepel group, where it borders several groups belonging to the early Bronze Age of the Carpathian basin (Kalicz-Schreiber and Kalicz 1998).

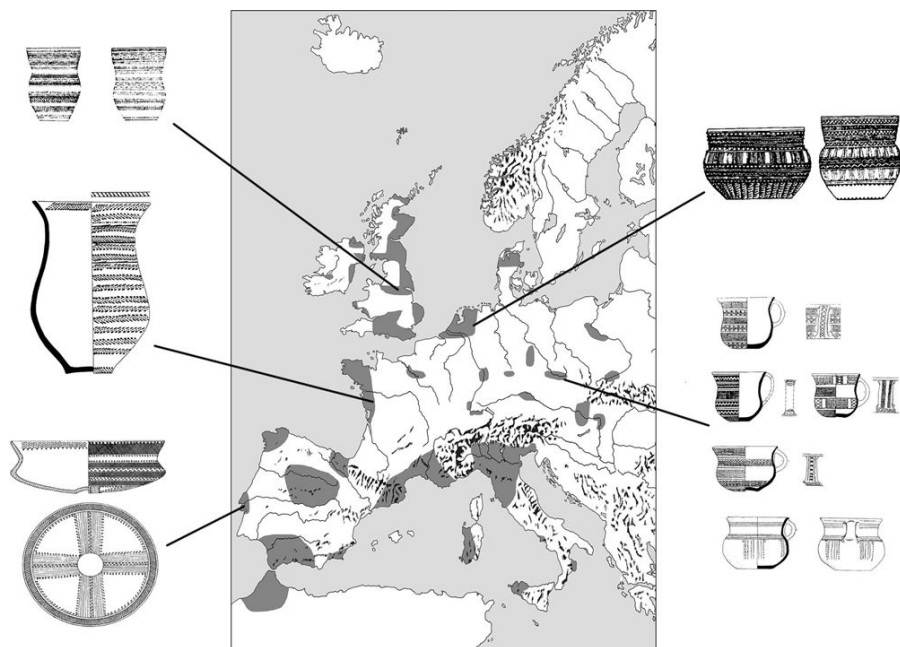


FIG. 31.1. Distribution map of the Bell Beaker Phenomenon and selection of European Bell Beakers. Upper left: British Bell Beakers (after Clarke 1970). Middle left: Bell Beaker from La Folie (after: Tcheremissinoff et al. 2000). Lower

right: Ciempozuelos style (after [Blasco 1994](#)). Upper left: late Dutch Bell Beakers (Veluwe style: after [Lanting and van der Waals 1976](#)). Lower right: Bohemian cups (after [Turek 1995](#)).

Several Bell Beaker islands are documented along the Atlantic façade. By far the most extensive and well-documented situation is Britain, where Bell Beaker finds stretch from Scotland to the southern English chalks ([Clarke 1970](#); [Needham 2005](#)). By comparison, the Irish group is restricted, although it played a crucial role in the introduction of copper metallurgy in the British Isles ([O'Brien 2001](#)). The BBP is well-established on the French and Spanish Atlantic coastline, from southern Brittany ([L'Helgouach 2001](#)) to the Gironde river ([Rousset-Laroque 1998](#)), and the Basque country ([Alday Ruiz 1996](#)). In the French Centre-Ouest, the Bell Beaker distribution is mutually exclusive to the area of the Artenac culture, although pots from this later culture sometimes imitate Bell Beaker decoration ([Rousset-Laroque 1998](#)). The conspicuous near-absence of Bell Beaker finds in the Seine basin ([Billard et al. 1998](#)) dramatically contrasts with the hundreds of collective burials of the previous late Neolithic ([Salanova 2004](#)). In the Iberian Peninsula, two small-scale, densely packed, groups are located in Galicia ([Rodríguez Casal 2001](#)) and in the Extremadura ([Cardoso 2001](#)). The Alentejo region presents a similar situation as the Paris Basin, with rare Bell Beaker finds contrasting with the hundreds of reported megalithic sites ([Salanova 2004](#)).

Lastly, several Bell Beaker islands lie around the Western Mediterranean basin. In southern France and northern Catalonia, the Bell Beaker groups are inserted in a complex cultural mosaic, with mutual geographic exclusion between them and the groups of the local late Neolithic ([Guilaine et al. 2001](#); [Martin Cóllica 2001](#)). Several Bell Beaker concentrations are reported in other parts of the Iberian Peninsula, as in the Meseta ([Blasco 1994](#)) and in Andalusia ([Lazarich González 2000](#)). The BBP is also well documented on the fringes of the Italian Alps and in the Pô valley, but, further south, is confined to the Tyrrhenian coast ([Nicolis and Mottes 1998](#)). A similar divide exists in Sicily, the BBP occupying the western shorelines and part of the central coast and inland, the local early Bronze Age developing in the east ([Tusa 2001](#)).

This general intricacy of the Bell Beaker islands and the various surrounding archaeological cultures—as well as the multiplicity of local substrata on which the BBP has developed—obviously plays a role in the creation of the global variability of the BBP ([Vander Linden 2006](#)). At the same time, this archipelago pattern indicates that any interpretation of the BBP must consider the links which enable the constitution of this archipelago across Europe.

Pots for the living, and other objects

Ceramic petrological studies designed to test Shennan and Clarke's hypothesis that Bell Beakers were exchanged between élites have established that with a few exceptions, Bell Beakers are always made of local raw materials (e.g. [Rehman et al. 1992](#); [Convertini and Querré 1998](#)). If Bell Beakers were not exchanged over long distances as the prestige goods model suggests, how to account for their typological similarities? African ethnoarchaeological analogies suggest that simple motifs can easily be borrowed and dispersed by potters, as their imitation does not imply extensive knowledge of the producing technique ([Gosselain 2000](#)). Whilst horizontal bands on Bell Beakers were widespread, preference for some motifs and the way these were symmetrically arranged ([Vander Linden 2006, ch. 13](#)) presents some regional consistencies, such as the use of metopes in central and north-western Europe ([Vander Linden 2006](#); [Prieto-Martinez 2008](#)). Likewise, technological analyses show some interesting regularities (e.g. preference for grog temper or cardium as a decorative tool: compare for instance [Convertini and Querré 1998](#) with [Cleal 1995](#); on the use of cardium, see [Salanova 2000](#)). Both elements indicate that, rather than the pots, it was actually the potters who were circulating within the BBP ([Salanova 2000](#)), perhaps as part of post-marital residency rules ([Vander Linden 2007](#)).

Some recurrent patterns concern the context of use and deposition of the Bell Beakers. In western Europe, so-called 'maritime beakers' (beakers characterized by a simple zigzag-based decoration, and widely distributed in western Europe, hence the term) were placed in graves over the entire Bell Beaker sequence ([Salanova 2000](#)), whilst in central Europe handled jugs were used in the same way ([Besse 2003](#)). Beyond geographical differences, there is thus a common theme in funerary practices which implies the deposition of a standardized pot in the grave. These pots could have contained an alcoholic beverage (beer or mead), an hypothesis most famously advocated by [Andrew Sherratt \(1987\)](#). Although the discovery of such 'Beaker beer' has been claimed on several occasions (e.g. [Dickson 1978](#), but see [Tipping 1994](#); [Rojo-Guerra et al. 2006](#)), Bell Beakers also contained a large array of things, from human bones to flint tools and carbonised food remains ([Pétrequin and Pétrequin 1988: 250–255](#); [Brodie 1997](#)). Despite this lack of unambiguous evidence, Beakers can be set in the context of wider third millennium BC types of drinking material culture in graves ([Sherratt 1987](#)).

One of the highlights of recent research has been the critical re-evaluation of domestic pottery. [Marie Besse \(2003\)](#) has defined three large complexes. Her first group loosely corresponds to modern France and comprises ceramic types not found in the preceding local late Neolithic cultures. Her central European group shares close affinities with the Corded Ware culture, as does the third, centred upon the lower Rhine basin (see also [Lanting 2007–8](#)). In northern Italy, domestic assemblages are a complex blend of central European, southern French, and local types ([Leonini 2004](#)). The Iberian Peninsula seems relatively distinctive, with the occurrence of large wide open vases, perhaps related to specific cooking practices ([Rojo-Guerra et al. 2006](#)). Potential links between the Netherlands and Britain have long been suggested ([Gibson 1980](#)), but await further investigation ([Woodward 2008](#)).

Despite several publications (e.g. [Mottes 2001](#); [Furestier 2007](#)), there remains a relative dearth of data on stone tools. A certain drop in quality is often acknowledged, but this trend only accounts for part of the situation. The BBP also witnesses the development of highly skilled lithic production, such as flint daggers (northern Italy: [Mottes 2001](#); Poland: [Czebreszuk and Kozłowska 2007](#)). An excellent example is the large-scale and specialized knapping of daggers and spearheads in northern Denmark ([Apel 2008](#)). Whilst these artefacts are mostly produced in Jutland, where the majority of Bell Beaker finds are located, they are distributed over a far wider zone where the BBP is not represented ([Sarauw 2007](#)). The manifold small and middle-scale exchange networks which stretch across parts of the BBP ‘archipelago’ (e.g. amber: [du Gardin 1998](#); stone: [Orozco-Kohler et al. 2001](#)) are just part of broader European social dynamics of the second half of the third millennium. None of these extends over the entire ‘archipelago’ and thus can account for its existence ([Vander Linden 2007](#)). Equally, whilst the rise of the BBP has long been linked with the spread of copper metallurgy ([Childe 1925](#)), this can only account for local, sporadic movements, as copper metallurgy was already well established in most of the ‘archipelago’ (see [Roberts and Frieman](#), this volume).

Death matters

Funerary practices exhibit a broad divide between, on one side, central and north-western Europe (Netherlands and Britain) and, on the other side, the French Atlantic façade and the western Mediterranean basin. In central Europe, flat graves are often grouped in small cemeteries (e.g. [Heyd 2000](#)). In Britain and in the Netherlands, round barrows prevail, with a primary central burial and

further burials added either above the first one or in peripheral positions (e.g. [Last 1998](#); [Drenth and Hogestijn 2001](#)). In both regions, a very few examples suggest that the dead could have been grouped on the basis of familial links (for central Europe, see [Heyd 2007](#); for Britain, see [Vatcher and Vatcher 1976](#)). [Mizoguchi \(1993\)](#) and [Last \(1998\)](#) have suggested that the successive interments in some British barrows could be read as genealogical statements by the mourners.

The thousands of known graves in central Europe almost unanimously follow the same rules: men are buried in flat graves on their left, head to the north facing east, whilst women are placed symmetrically, i.e. flexed on their right, head to the south, also facing east. A few exceptions exist ([Müller 2001](#)): for instance, cremation prevails in the Hungarian Csepel group, probably under the influence of the local early Bronze Age cultures ([Kalicz-Schreiber and Kalicz 1998](#)). A similar gender dichotomy is observable in the Netherlands ([Lanting 2007–8](#)) and Britain, although more chronological and geographical variation is encountered in the latter region ([Garwood 2007](#)). Grave goods also stress a gender dichotomy. Men often receive a beaker, a weapon (triangular daggers, stone bracers, arrowheads), and bow-shaped pendants. Women are often given a larger range of ceramics than the mere Beaker, as well as various ornaments. Interestingly, children are buried similarly to the adults. Not only do they follow the same position/orientation scheme, but in central Europe, some children were given extraordinary grave goods, in particular weapons ([Heyd 2007](#)). Ireland stands apart from Britain, as individual graves are extremely rare and most funerary finds are isolated objects from megalithic monuments ([Case 1998](#)).

Two recent studies on bracers throw some light on these objects ([Woodward et al. 2006](#); [Fokkens et al. 2008](#)). An analysis of English bracers shows that few present wear traces, suggesting these items were not intended for and used as part of archery practices ([Woodward et al. 2006](#)). By studying the position of bracers in a selection of north-western and central European graves, [Fokkens et al. \(2008\)](#) have shown that these wristguards were mostly not worn on the inside part of the arm, as would be expected for archery equipment. Consequently, they argue that bracers were non-functional items displaying ideal warrior images and contributed to a wider martial ideology indicated by the deposition of weapons in graves. [Woodward et al. \(2006\)](#) also demonstrate that English bracers belong to two coherent petrological and technological groups and were embedded in complex exchange networks stretching across Britain.

In the rest of the Bell Beaker domain, treatment of the dead is more diverse. Finds, both individual graves and beakers in megalithic contexts, remain scarce in the Paris basin ([Billard et al. 1998](#)). Beakers

have frequently been found with burials in Breton megalithic chambers, but contextual information is generally poor because of the complex life-history and taphonomy of these sites (L'Helgouach 2001). A similar situation occurs in western France, with finds in megalithic monuments (Roussot-Laroque 1998) and few individual graves, such as the recently excavated site of La Folie, where the tomb was surrounded by a ring of postholes, a structure reminiscent of several Dutch sites (Tcheremissinoff et al. 2011). Likewise, southern France is mostly characterized by the re-use of older megalithic monuments and collective burials (Guilaine et al. 2001), although again, taphonomic problems generally prevent more detailed understanding of these re-use episodes (Chambon 2003). A handful of individual graves are known (e.g. La Fare: Müller and Lemerancier 1994). Another instance of an older megalithic monument with a secondary Bell Beaker phase is the Swiss site of Le Petit-Chasseur in Sion, which also provided one of the very few cases of Bell Beaker human representation in the form of highly decorated stelae (Harrison and Heyd 2007; Robb, this volume). There are few individual burials in northern Italy, some of them comprising the classical maritime beaker-weapon association (e.g. Santa Cristina, Ca' di Marco: Nicolis 2001b). Further south on the mainland and in Sicily, Bell Beaker material is found in funerary caves and hypogea (e.g. Tusa 2001). Sardinian bell beakers are placed in caves, megalithic burials, cists, and hypogea, the funerary evidence pointing to a complex mixture of individual and collective graves with post-depositional movement of the bones (Atzeni 1998). The Iberian Peninsula presents a similar range of possibilities, with Bell Beaker artefacts in megalithic burials (Galicia: Rodriguez Casal 2001; Pyrenees: Martin Colliga 2001; Basque country: Alday Ruiz 1996), individual graves set in older megaliths, sometimes associated with architectural modifications (e.g. Estremadura: Cardoso 2001), and a well-established tradition of individual burials in the later Ciempozuelos group in the central Meseta (Blasco 1994).

The cultural Bell Beaker attribution of these various types of sites rests on a restricted range of artefacts, namely Bell Beakers, preferably of the maritime type, and weapons such as copper triangular daggers and so-called Palmela points, distributed over the entire Iberian Peninsula and southern France (e.g. Briard and Roussot-Laroque 2002). This homogeneity of grave goods mirrors the situation in central and north-western Europe and thus constitutes the principal common trait to the entire Bell Beaker domain. Beyond this apparent uniformity lies something more fundamental: grave goods express idealized identities for the dead, of which the more salient is the man as warrior/hunter (Shennan 1993; Vandkilde 2005; Heyd 2007; Fokkens et al. 2008). The identities are ideals as, for instance, many of

these men probably never fought during their lifetime (see for southern France: [Guilaine and Zammit 2001](#)), but were given brand new weapons, perhaps made and/or acquired specifically for deposition in the grave. The presentation of child burials in the same way reinforces this point. These men are not necessarily warriors or hunters, yet were categorized as such for other social, religious, cultural, and/or political reasons. In conclusion, although the period is sometimes heralded for the rise of individual burial, what we witness here is the establishment of a collective way to deal with the dead, if not with death *per se*.

Settling the landscape

Settlements have traditionally been the poor relation of Bell Beaker studies. Whilst the documentation is now extensive across Europe, evidence remains conspicuously lacking in some areas (see [Allen 2005](#)). Information on Bell Beaker settlement in Britain remains relatively scarce ([Bradley 2007](#), 150–152). This is especially true when compared to the frenzy of monuments built during the second half of the third millennium BC, including extraordinary sites such as Stonehenge ([Parker Pearson et al. 2007](#)) or Silbury Hill ([Bayliss et al. 2007](#)), which, if they do not consistently yield Bell Beaker artefacts, make the British landscape unique in Europe for this period. This British peculiarity also reminds us that, despite the massive impact of the BBP there, local communities were at the core of the processes involved. A growing body of evidence for field clearance and boundaries is also emerging ([Field 2008](#)).

Dutch Bell Beaker settlements include Molenaarsgraf ([Fokkens 2005](#)) and Emmeloord (see [Arnoldussen 2008](#)), where the remains of fishways are a rare opportunity to document the potential role of fishing in the diet of these communities ([Bulten et al. 2002](#)). The Danish Bell Beaker group was always primarily documented in settlements, characterized by so-called sunken-floor houses, recently confirmed by the discovery of some large sites, such as Bejsebakken with its 23 houses, by far the largest concentration of house plans for the entire BBP ([Saraauw 2007](#)). By contrast, central Europe remains largely devoid of Beaker settlements. This situation is the likely result of architectural techniques leaving limited archaeological traces, as demonstrated in eastern French sites with waterlogged preservation of, among others, construction wood ([Pétrequin and Pétrequin 1988](#); [Shennan 1993](#)). In Bohemia, the distribution of pottery surface scatters suggests preferential settling on south-facing valley slopes ([Turek et al. 2003](#)).

The western Mediterranean basin yields more extensive settlement

evidence. Estimates for southern France alone suggest that no less than 300 domestic sites are known ([Guilaine et al. 2001](#)). Sites are variable, including some impressive dry-stone structures, which already featured prominently in the local late Neolithic, or some clearly defensive sites (e.g. Camp-de-Laure and Le Mourral: [Vaquer 1998](#)). Variety is also the main feature of Bell Beaker settlements across the Iberian Peninsula, with the use of caves, open-air settlements, or the partial re-affectation of older grand stone buildings, such as Leceia and Zambujal in the Estremadura ([Cardoso 2001](#)). The Meseta hosts an important concentration of open-air sites, often close to rivers, and defensive sites in its central part, the majority of them belonging to the local Ciempozuelos groups ([Blasco 1994](#); Catalonia, Murcia and Valencia region: [Harrison 1977](#)). The proximity to freshwater sources, particularly rivers, is well documented in northern Italy and the Florentine plain ([Nicolis 2001b](#); [Sarti 2004](#)). Caves were also inhabited ([Nicolis 2001b](#)). Evidence for settlement is scanty in the rest of the mainland as on the islands.

MOBILITY AND COMPLEXITY: THE RETURN OF THE BEAKER FOLK?

A growing number of isotopes studies have recently demonstrated that within the BBP, many people did not die in the same place as they were raised. Price and colleagues showed that more than half of their sample of some 80 individuals had relocated at one point during their life, although the geographical scale of these movements remains unclear ([Price et al. 2004](#)). A few years ago, it was shown that the Amesbury archer could have come as far as Bavaria ([Evans et al. 2006](#); [Fitzpatrick 2011](#)). For a community of researchers educated in a dogmatic denial of migrations, this was astonishing. But there is much to support the view of human mobility during the BBP. The archipelago patterning itself suggests that movements of some sort must have taken place within and between each of the islands, the available documentation preventing further precision. As pots themselves were not moving, and other exchange networks were relatively local, movements of individuals have to be considered to explain typological similarities between different groups. The study of pottery techniques and the re-appraisal of domestic assemblages provide further elements to the argumentation ([Vander Linden 2007](#)). Yet the extent of human mobility remains difficult to appraise. [Alison Sheridan \(2008\)](#) has interpreted some Scottish graves as pioneering equivalents of the Amesbury Archer, suggesting that these people could have been metal prospectors. The reason for their journey might

be uncertain, yet the fact that they were buried according to stereotyped Bell Beaker procedures implies that they were not isolated in alien cultural milieus, but part of a larger group responsible for conducting the proper funerals.

This last point is crucial. Beyond the movements of individuals, probably a feature throughout prehistory, the BBP stands out for two reasons. First, movement must have been structured in some way, for instance through restrictive exchanges of marriage partners ([Vander Linden 2007](#)), in order to lead to the regularities observed in different facets of the archaeological record, especially ceramic decoration and morphology, and settlement pattern. Second, these people were not simply moving, but were diffusing at the same time as new funerary practices based on categories of dead and of grave goods. The stereotypy must have led to a feeling of shared identity, accompanied by a voluntary and reciprocal engagement. Thus, if we as archaeologists recognize a common Bell Beaker theme in funerary remains, it is because people were constantly re-enacting the same categories and the same associated practices.

BY WAY OF CONCLUSION

This brief review indicates that, beyond the evident material variability, there is a geographical patterning, echoed by each category of evidence ([Vander Linden 2006](#)). The main divide lies between central and north-western Europe, and the Atlantic façade and western Mediterranean basin. Within each of these large areas, further distinctions can be observed, with higher homogeneity between Britain and the Low Countries, while Denmark and especially Ireland are somewhat peripheral. The various central European groups also exhibit close affinities, with the exception of the Hungarian Csepel group. Similarly, the Iberian Peninsula presents a relative identity when compared to the rest of the western Mediterranean basin. These frontiers fluctuate according to the type of evidence privileged, and throughout the chronological development of the BBP. If these cultural regions roughly mirror some divisions in European physical geography, their stability remains impressive. Within each region, the links between the various Bell Beaker islands are tighter and more dense than within the BBP in its entirety. The establishment and maintenance of the BBP over such a large area and for several centuries thus results from the sum of manifold interactions, backed by a complex pattern of movements of ideas and individuals.

Several issues, such as the origins of the BBP and the nature of social differentiation, have been omitted from this account. These are

important, but the criticisms made of the prestige model here—and elsewhere (Brodie 1994)—show that putative new élites do not explain the spread and constitution of the BBP in its entirety. A series of explanations are required to explain specific expansions and local social and cultural developments, but I have shown that alongside variability, the BBP does present some global coherent structure. Three simple processes account for this: human mobility; the resulting diffusion of practices; and the use of specific categories in burying the dead. In this sense, the BBP is not so much a tale of social hierarchy than one of multiple social links giving substance to a network of people, practices, and material culture.

NOTE

1. The term Bell Beaker is used in this paper as it corresponds to the various terminologies used in continental Europe (French *campaniforme*, German *Glockenbecher* ...). The more general term Beaker can be found in the English-based literature but is misleading as it incorporates related but autonomous continental archaeological phenomena such as the Corded Ware Culture.

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CHAPTER 32

A MINIATURE WORLD

Models and Figurines in South-East Europe

STRATOS NANOGLOU

INTRODUCTION

A fascination with the world of miniature models, be they of human or animal bodies, buildings or furniture, has a long history in archaeology. A primary reason for this seems to be that models have been, and to a certain point are still, considered to hold an exceptional position from which we can study some non-materialistic aspects of prehistoric life (Ucko 1968, xv), to offer a window to the prehistoric mind (see Bailey 1996, 293). Yet models are objects present in the world under specific conditions and their materiality is paramount to their meaning and effectiveness in social life (see Meskell 2004; Miller 2005 for general assessments of materiality). Although an earlier generation of archaeologists mostly accepted them as reflecting social relations, rather than constituting them, recent studies have increasingly focused on the way objects, including miniatures, were experienced in specific contexts and at the same time how objects affected experience and acted upon social life (Joyce 2000; Meskell 2004; Meskell and Joyce 2003). Objects, including miniatures, emerge as part of the very conditions of experience (Barrett 2005), that is, the terms by which experience and life are made possible (Nanoglou 2009a). All this means that we should approach miniatures as objects with a specific size, texture, colour, form, etc., which, when produced, used, and deposited in specific contexts, affected experience in particular ways (Bailey 2005; Gaydarska et al. 2005, 2007; Meskell 2007; Nanoglou 2009a). Miniatures, then, re-present (Nanoglou 2008a, 2009b) an inhabitable position, one that makes sense, and thus set the terms by which inhabitation is possible, normalizing certain versions of life over others. It is important to consider that miniatures act upon us, before we can act, before we have the ability to act, and thus they set the terms by which action is possible before we can

make a choice. Accordingly objects, miniatures, representations, figurines, pots, along with human bodies, animal bodies, etc., set the terms by which someone is recognized, by which any recognition (of a person, of a member of the community, of a woman or a man, of someone accepted or cast out) is possible, before someone is able to act back and change the terms. This process affects the ontological status of all entities and therefore the study of the terms imposed by miniatures is of grave importance for any question regarding life in the past. This is true whether we interpret them either as mundane or as sacred objects, although such an interpretation bears upon their suggested role in social life. Here I will not enter this debate, although I concur with critical voices that challenge over-arching narratives such as the Mother Goddess myth (Bailey 2005; Bánffy 2001; Hansen 2001a; Meskell 1995; Ucko 1968). This chapter explores these issues, focusing mainly on the interplay of the themes, the media, and the materials that miniatures employ through the Neolithic, starting with a longer description of the initial phases and continuing with the changes that followed and which probably built on this initial tradition. In the end I come back to the whole issue of crafting a miniature world and its consequences for social life. Although I will consider as many cases as possible I do not intend to be exhaustive, and the reader is referred to comprehensive studies elsewhere (e.g. for human figures, Hansen 2007).

THEMES, MEDIA, AND MATERIALS

People living in south-east Europe during the Neolithic came across various objects that represented humans, animals, buildings, or other items in miniature form. Yet the practice of making and using miniatures was not uniform across the area, not least because miniatures range from a handful to thousands on any given site (Hansen 2007, 161–162; Nanoglou 2006, 160–161). Accordingly the effect of miniatures on people would have varied, even in terms of the frequency with which someone came across them. In the seventh and the first half of the sixth millennium BC people would have mostly encountered miniatures made of fired clay, that is free-standing figurines (Figs 32.1 and 32.2), figural vessels (Fig. 32.3), figures attached to or painted on vessels or three-dimensional models (Fig. 32.4), all these in varying ratios. In communities established in the south of the area (modern Greece, southern Bulgaria, Former Yugoslav Republic of Macedonia (hereafter FYROM), Albania), human figurines were probably the most common objects, with animal figurines following in much lower numbers (Bailey 2000, 2005; Demoule and

Lichardus-Itten 1994; Hiptmair 1997; Korkuti 1995; Lichardus-Itten et al. 2002; Nanoglou 2008a, 2009b; Naumov 2009). Anthropomorphic (Pileidou 2006) and zoomorphic (Nanoglou 2009c) vessels were present but not very common, whilst house models¹ were a later addition to the repertoire, with the earliest examples from Thessaly dating to the first half of the sixth millennium BC (Fig. 32.4c–d; Toufexis 1996; Toufexis and Skafida 1998) and the ones from FYROM or Bulgaria around the same time (Fig. 32.4a; Naumov 2009; Nikolov 1990; Sanev 2006). Furniture was also present, both independently modelled or merged with figurines (Fig. 32.1c; Theocharis 1973, fig. 214 and 37 respectively). Stone figures did exist, but they were infrequent and most of them bore holes probably for suspension (Hansen 2003, 348; Kyparissi-Apostolika 2001), suggesting that they may have constituted a distinct class of objects (Nanoglou 2008b). Furthermore most of them were of human form, with only a handful of animal ones known (surprisingly, in the form of frogs: e.g. Rodden 1964). There were very few occasions where shell or bone was used as a material and we can certainly suppose that wood might have been used too, but no wooden example has survived. The various classes have some distinctive traits worth exploring. Human figurines almost always showed a certain gesture and posture (Figs 32.1a, c, d), which could suggest a preoccupation with an active body (Nanoglou 2005), whilst after 6000 BC painted figurines became common in southern Greece (Talalay 1993) and were present in central Greece as well; animals were mostly of a generic type that perhaps defies categorization as domesticate or not (Nanoglou 2009c); house models from Greece were of a roofed type with a variable number of openings, which suggests a certain focus on the exterior (Toufexis 1996), whilst the ones from FYROM had a human figure on top of the roof (Fig. 32.4a; Hansen 2007, 150; Naumov 2009, 75; Sanev 2006; Zdravkovski 2006); finally, stone pendants included the only cases where ‘autonomous’ body parts were represented, invoking a body that was capable of being compartmentalized, albeit temporarily, for if they were indeed pendants they were still part of the body that bore them (Nanoglou 2008b).



FIG. 32.1. Anthropomorphic figurines from Thessaly, Greece: a. Chara 1 (earlier Neolithic); b. Makrychori (later Neolithic); c. Magoula Koutsouro (earlier Neolithic); d. Sitochoro 2 (earlier Neolithic).

(Photos by the author).

		Trench					
1977-78	14	15	16	17/20/22/23	18/21	19	24/25
IX							
VIII							
VII							
V-VI							
IV							
III							
I							

FIG. 32.2. Anthropomorphic figurines from Selevac, Serbia.

(After [Milojković 1990](#), fig. 11.16b. Reproduced with permission).

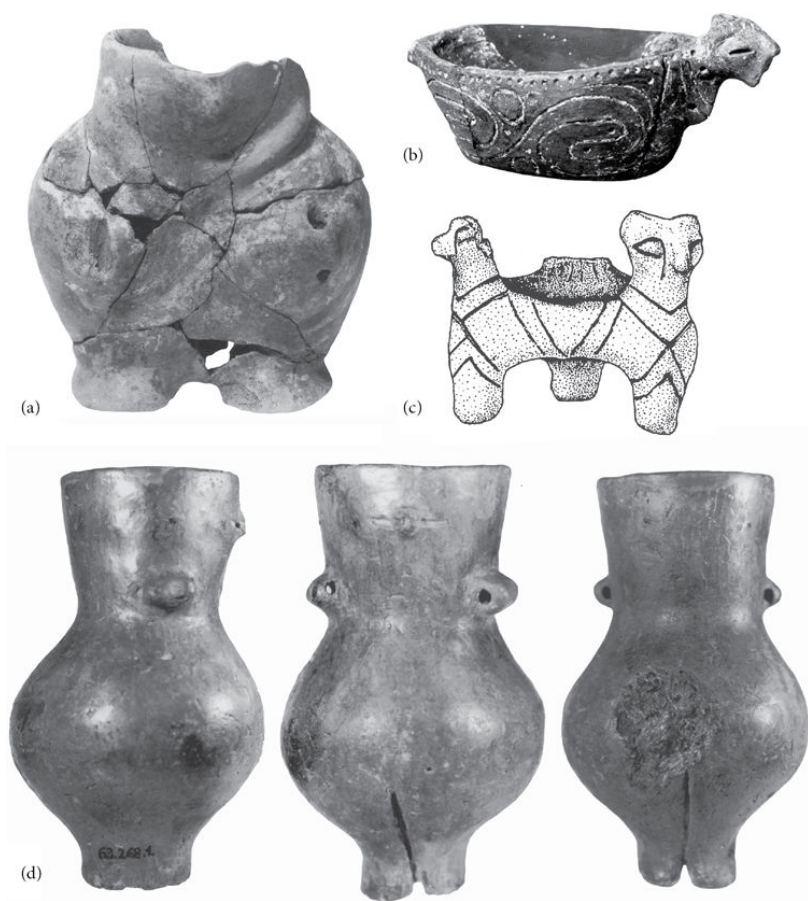


FIG. 32.3. Anthropomorphic and zoomorphic vessels: a. Rakitovo, Bulgaria (earlier Neolithic); b. Dikili Tash, Greece (later Neolithic); c. Selevac, Serbia (later Neolithic); d. Rákóczfalva, Hungary (earlier Neolithic).

(A: after Hansen 2007, Tafel 170.1; b: after Theocharis 1973, fig. 230; c: after Tringham and Stevanović 1990, fig. 10.22b; d: after Hansen 2007, Tafel 119. All reproduced with permission).

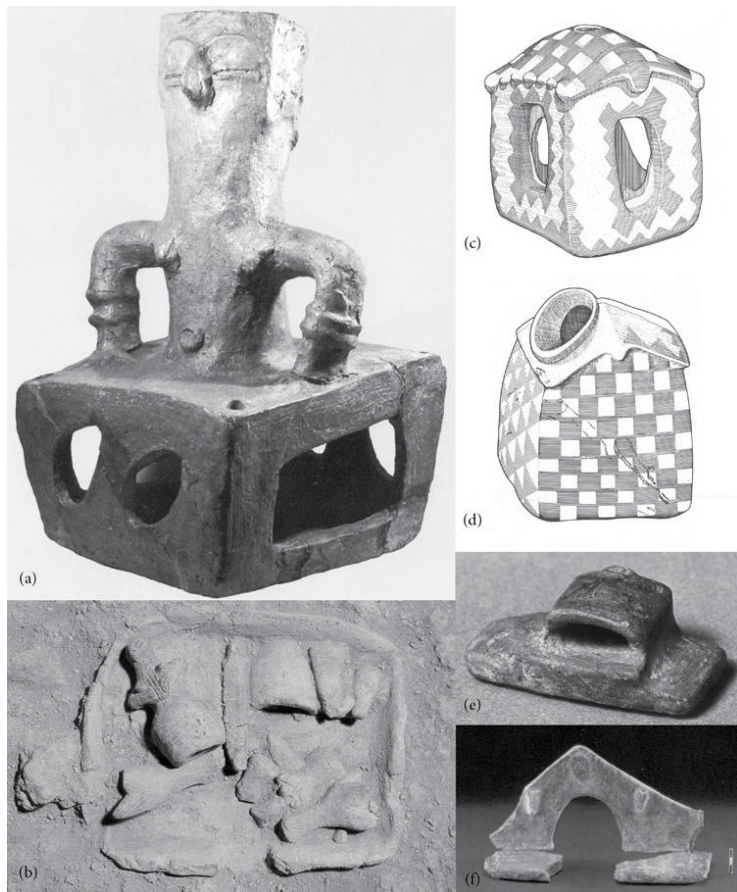


FIG. 32.4. House models and an oven model: a. Madžari, FYROM (earlier Neolithic); b. Platia Magoula Zarkou, Greece (c. 5300 BC); c. Crannon (earlier Neolithic); d. Myrrini (earlier Neolithic); e. Oven model: Sitagroi, Greece (later Neolithic); f. Promachon-Topolniča (later Neolithic).

(A: after Hansen 2007, Tafel 140; b: courtesy of K. Gallis; c. after Theocharis 1973, fig. 192; d: after Theocharis 1973, fig. 193; e: after Theocharis 1973, fig. 131; f: after Koukouli-Chrysanthaki et al. 2007, fig. 25. All reproduced with permission).

So in the southern part of the Balkans we can reconstruct a miniaturized landscape populated predominantly by human representations that focused on an active body. Some of them were produced expediently from a single lump of clay, others with great care and significant investment of time and effort, many times from various conjoined parts that were occasionally held together using pegs from perishable materials (Hourmouziadis 1973; Talalay 1993; see also Berger 2005; Hansen 2004 on specific case studies). Whether the latter practice had any meaning other than facilitating production is debatable (Hourmouziadis 1973, 40; Nanoglou 2008b, 318), but it has been invoked as evidence to suggest that figurines were made this

way to aid their fragmentation (Chapman 2000; Talalay 1987). The life of the objects after their manufacture is hard to explore, but certain wear traces (Nanoglou 2005, 147) and breaks (see Chapman and Gaydarska 2007; cf. Gaydarska et al. 2005, 2007 on later material) suggest that they were used in a repeated fashion for such wear to happen. Their final deposition was in settlements, both within and outside buildings, as well as in burial grounds, so it seems that there was not any single overall pattern (Hansen 2007, 130, 155–156, 182–185; Nanoglou 2008a, 3–4). There are cases in Greece where groups of figurines have been deposited together, but in a disorderly fashion, which speaks in favour of interpreting the figurines as parts of groups rather than individually and gives a new perspective to the details depicted (Nanoglou 2008a, 8). Some of them were probably made *ad hoc*, others to be used frequently and repeatedly. Some may have been discarded right after use, others long after. In any case, these objects naturalized an active body, which only occasionally and under specific conditions invoked further details, like genitals and breasts (Nanoglou 2010). When in groups it seems as though each group combined bodies involved in a variety of actions and poses, rather than, say, a group of figures in the same stance (Nanoglou 2005, 149; cf. Fig. 32.4b). The cases where groups of figurines have been found together do not include any animal figures and this might suggest that these occasions were extremely anthropocentric (Nanoglou 2008a). Whatever the role reserved for animal representations was, and we remain in the dark regarding that, it did not presuppose any specific action or characteristic on their part. On the other hand, house models from Thessaly perhaps invoked ‘special’ buildings (Nanoglou 2008c, 148–149), whereas the models from FYROM perhaps materialized a specific metaphor that identified the building with the human body. It is probably important that the one class of objects that were literally parts of the body, pendants, were made of another material and this could suggest that there was indeed a categorical distinction between ‘actual’ human bodies and clay ones, something that resonates with the representation of animals almost always in clay. On the other hand, it could suggest that bodies of flesh and clay were deemed ontologically similar and that any prosthetics were clearly distinguished, in the fear of being somehow absorbed.

In contrast, in the northern part of the area the focus was balanced between humans and animals. Humans were represented generically with only occasional depiction of posture and/or gesture (Nanoglou 2008a; see also Hansen 2007) and a sporadic exaggeration of the buttocks (Hansen 2007, 156). Animals were quite common as self-standing figurines, as zoomorphic vessels, or attached to vessels (including so-called ‘altars’) and as small clay animal heads, usually

with horns—a type which is not found in the southern part of the Balkans (Bánffy 2001; Budja 2003; Elenski 2004; Kalicz 2000; Nanoglou 2008a, 5; Vuković 2004). Most animal figures (including zoomorphic vessels and figures attached to vessels) did not show many details, although there are cases where deer have been identified (Bánffy 2001; Karmanski 2005). Horned animal heads were not infrequent (Budja 2003; Elenski 2004; Kalicz 2000; Vuković 2004), although it is interesting that this type of object depicts only part of the animal. All in all this lack of detail is deployed alongside a non-detailed human image, highlighting no essential difference in the way humans and animals were represented and allowing us to consider them as equal components of whatever practice was enlivening them, although there is no evidence that human and animal figures were actually used together, apart from their co-existence in the communities. The presence of an animal on a house model from Röske-Ludvár, Hungary (Bánffy 1990–91, 213; Tringham 1971, 85, fig. 14e) attests perhaps to the suggested importance of animals, especially if compared with the models from FYROM (but see another possible example of an animal on a house model from Thessaly, Greece: Toufexis 2003, fig. 29.3).

If miniatures solicited a reaction towards the recognition of oneself and others, this most probably entailed the invocation of action in the southern Balkans. The focus on humans and their actions, as opposed to humans-cum-animals in the northern Balkans, normalized an anthropocentric community of sorts, even if this community was only sanctioned for the specific occasion during which the miniatures were used. The ontological status of the entities admitted to the occasion was contingent on their actions, whereas in the northern part of the area entities were judged and recognized by their generic form. It seems significant that house models are commoner in the part of the area where the concern with human action was prominent and settlement space more densely occupied (Nanoglou 2008a, 8; see also below). Their appearance might suggest that at least some kinds of buildings were institutionalized and objectified as definable social entities.

This picture changes after 5300 BC, when in the whole area from eastern Hungary to Greek Macedonia we can discern a concern with the generic human image and a preoccupation with the surface of the body, evidenced in the significant (but not predominant) presence of incised or painted decorations, whilst a certain focus on the head has become evident in some regions (Fig. 32.2; Bailey 2005; Bánffy 2001; Chapman 1981; Hansen 2007; Letica 1988; Milojković 1990; Nanoglou 2009b; Nanoglou and Pappa 2009; Talalay 2004). Seated figures did exist (Berger 2005; Hansen 2004; Lichardus et al. 2002),

but not the variety of postures and gestures seen in earlier Neolithic Thessaly. Incised or painted decorations are present on both human and animal representations, so again there were similarities between them. This view is perhaps strengthened by the increased presence of ambiguous or hybrid images that are difficult to categorize as either human or animal, images that are quite common in the whole area (Bánffy 2001; Chohadzhiev 2007, 114; Nanoglou and Pappa 2009). Nevertheless animals proliferate in this period, especially as figures attached to vessels (Fig. 32.3b, 3c; Bánffy 2001; Nanoglou 2009c; Nanoglou and Pappa 2009) or to buildings and house models (Fig. 32.4f; Koukouli-Chrysanthaki et al. 2007; Marangou 1996; Nanoglou 2009c). It is difficult to assess what was going on in Thessaly and southern Greece, for there are not many assemblages published from this period. Certainly there is a lack of incised figurines both in the mainland and the Aegean islands (Evans 1964; Nanoglou 2006, 167; Talalay 1993), but the human body is again only generically rendered. Some stone figurines were produced around this period (Berger 2005, 195; Chapman 1981, 120; Evans 1964, 237; Talalay 1993, 66), but they are in the minority.

Contextual information for this and the following period is sketchy, but when offered (Bánffy 1990–1; Bailey 2005, 62–63, 109–112; Letica 1988; Tringham and Conkey 1998) suggests that there was no overall common practice towards miniatures. They have been found in both cemeteries and settlements (Bailey 2005, 60–63; Nanoglou 2009b, 291) and most of the objects from the settlements are found in discard contexts (Tringham and Conkey 1998), yet there are cases where some of them have been deposited as a group (Bailey 2005, 109–112; Chapman 2000, 108–112; Letica 1988, 179; Marangou 1996; Todorova 1982, 67; Ursulescu and Tencariu 2006). Marangou (1996, 179) refers to a few cases where animal figurines have also been found in groups, and this might suggest that animals were also meaningful when in groups rather than individually. It is difficult to evaluate these cases towards a tradition, since we do not know much about previous depositional practices. If they were gathered separately, it may suggest that humans and animals do not mix ‘on stage’.

House models show some changes too. Alongside the models which continued the tradition of the previous period, namely perpendicular models with pitched roof (see especially examples from Bulgaria, Todorova 1982), in some parts of the area (particularly Thessaly and Macedonia, Greece) open-roofed models became more common than before. Given the small number of published examples it is difficult to say anything meaningful on the relative occurrence of these two types. The earliest examples of open-roofed models also date to the previous

period; Nikolov describes one from Slatina, Bulgaria (1990, 83), which dates to the earlier Neolithic, whilst the model from Platia Magoula Zarkou, Greece, which included eight figurines (Fig. 32.4b; [Gallis 1985, 2001](#)), probably dates around 5300 BC. But most examples date from the fifth and the fourth millennia ([Toufexis 1996](#); [Todorova 1982, 67](#), as do the figurines found inside; see also [Marangou 1996](#)) and they probably designate a change of focus from the exterior of the building to the interior ([Toufexis 1996, 161](#)) or even to the users of the building and their actions ([Nanoglou 2001, 309](#)). This interpretation is perhaps reinforced by the occurrence of a few oven models (Fig. 32.4e; [Chohadzhiev 2007, 120](#); [Renfrew et al. 1986, fig. 8.20b](#)), which are placed indoors where they occur in house models (e.g. [Gallis 1985](#); [Gallis 1992, 129](#); [Renfrew et al. 1986, fig. 8.20a](#)). This change does not seem to replace the previous trend, but rather to accompany it. Furniture was modelled separately from figurines, although still associated contextually with them ([Mantu et al. 1997, cat. no. 12](#); [Todorova 1982, 67](#)).

At the same time, that is the period after 5000 BC, we again see significant changes in various regions. In northern Greece stone figurines, especially marble ones, proliferated (Fig. 32.1b; [Nanoglou 2008b](#)), amounting to half the objects on certain sites (e.g. Makriyalos: [Nanoglou and Pappa 2009](#)). Incised decorations proliferated in many areas ([Bailey 2005, 119](#); [Berger 2005, 209](#); [Milojković 1990, 412](#); [Popov 2002](#); [Renfrew et al. 1986](#)), but not in others, such as north-east Bulgaria or southern Greece ([Bailey 2005, 119](#); [Talalay 1993](#)). During this period the association of animals with vessels remained strong, particularly quadrupeds of a generic type that, as before, defies categorization according to species ([Bánffy 1997, 2001](#); [Berger 2005, abb. 2](#), [Kalicz 1998](#); [Nanoglou 2009c](#)).

Accordingly, figurines would have guided some people across the area to continue focusing on a generic image, and others to reject previous practices and refocus on a motionless body. In both cases many bodies were further elaborated through incisions, presenting a body with identifiable insignia as a naturalized precondition, prompting viewers to identify these bodies by their insignia, to address them and to situate themselves within the world through these traits, although we remain in the dark as to whether people used relevant insignia on their bodies too. Furthermore, in many communities in Greece (in some cases alongside the practice just described) people were confronted by figures that used their material as a major distinctive point. New variables entered the scene and reformulated the field of normality, with some sort of elaboration of what people should look like. Along with an ongoing, and in some areas increasing, association of animals with vessels, these changes set

the ground for a new ontological status of humans and animals, whereby humans were judged by their appearance and animals were further, and perhaps restrictedly, defined as containers of some sort (Nanoglou 2009c).

The preoccupation with the use of different materials is evidenced in more regions after 4000 BC, as in the case of the fourth millennium BC bone figurines from the eastern Balkans (Hansen 2007, 224ff; Popov 2002; Terzijska-Ignatova 2004), although they did appear earlier (Berger 2005, 213), or the figures made of shell (e.g. from Durankulak, Vajsov 2002, 261–262), but still most figurines were made of clay (Berger 2005; Bondár 2008; Hansen 2007). Artefacts usually called ‘ring-idols’, found all over south-east Europe and dating to the fourth millennium BC, were also made of a variety of materials (gold, silver, copper, stone, or clay: Hansen 2007, 282ff, with references). Finally, a reversal of the predominance of clay can be seen in the Aegean islands during the third millennium BC (Broodbank 2000; Hendrix 2003), where marble was used almost exclusively in many cases. In these later periods, animal representations are not very common, but certain aspects of what was practised up to then were continued, whilst others changed. Animals were still associated mainly with vessels (Rutter 1993), whilst in other cases, animal figurines were found in comparatively large numbers (Tzavella-Evjen 1984). House models were also scarce (Marangou 1990, cat. no. 23), whereas furniture was again mostly merged with seated figurines (Marangou 1990). Both of these categories of artefacts follow the current trends, being made of stone.

SOUTH-EAST EUROPE AS A REGION IN MINIATURE

This brief exploration is probably enough to suggest that each tradition was apprehended, understood, and negotiated locally. Certain aspects were most probably seen, heard, experienced, and further cited on new occasions, extending particular spatio-temporal instances whereby miniatures were used (Nanoglou 2006). But this citation was not always conscious and not always felicitous, and probably resulted in mixing up, rearticulating, and even misunderstanding previous instances. The use of similar artefacts over extensive areas does not necessarily suggest that they had the same meaning. The continuities we see today, reflecting on such a long period of time, might be a product of our own abstraction process in our effort to make sense of the materiality at hand. Furthermore it should be stressed that humans and animals were not represented solely in miniature form (Hansen 2001b; Robb 2009). Nevertheless,

when put into a wider European Neolithic perspective, south-east Europe does seem to stand out regarding the use of miniatures (Thomas 2005; Scarre 2007). So what was distinctive to miniatures? Some authors suggest that miniaturism evokes intimacy (Bailey 2005; Scarre 2007), but someone can experience intimacy in monuments too. On the other hand miniatures can evoke distance if they are unfamiliar. Their size means that they could be handled and carried around (Bailey 2005) and they could be gathered in groups and dismantled (Marangou 1996) with a certain ease, allowing some sort of 'staging' or presentation. In this vein they could have affected people in subtle ways, not being visible or set up all the time. They probably did not arrest people's attention, as we might suppose of more monumental figures. Their materiality does make a difference and in this vein so does the possible change in their materiality, when for instance they were broken. A growing number of scholars suggest that their breakage was intentional as part of a process people performed to relate to each other, holding the broken part as evidence of their transaction (most prominent studies being Biehl 1996, 2003, 2006; Chapman 2000; Chapman and Gaydarska 2007; Talalay 1987; see also Bánffy 1990/1991, 202–203). Concerns about this model can be found in various studies (e.g. Bailey 2001, 2005, 112; Nanoglou 2005, 143), but one important point is that this approach does bring into focus the materiality of the objects (albeit in different nomenclature) and their life as objects, which is perhaps the only way to break away from a highly decontextualized discussion of representational practices.

This call to contextualization begs the question of the resonance of representational practices with other aspects of social life. In light of the argument followed here, that material culture is constitutive of subjectivities, the differences just described would suffice to talk of different worlds, even if nothing else was different among the various areas explored. The very practice of making and using these artefacts would have constituted and sustained different regional identities (Nanoglou 2006). So, instead of trying to find out whether these differences corresponded to other practices (say architecture or burials), in order to explain representational differences, as if they follow upon deeper structures, perhaps what is needed is to reinterpret these other practices from the perspective of representational practices. Of course the life of the inhabitants in the various areas examined was different (and similar) in many aspects. The communities of earlier Neolithic Thessaly seem to have invested more on densely occupied locales (Kotsakis 1999), whereas in the north a looser organization is argued by experts (Bailey 2000, 2005, 4–5). We could relate this to the differences in representations,

suggesting perhaps that the looser architecture in the north helped incorporate the whole gamut of represented entities—that is, humans and animals—within the settlement, whereas in Thessaly the overt preoccupation with humans is evident in architecture as well (Nanoglou 2008a, 8, but see Nanoglou 2008a, n. 9). We could expand the list of relevant practices, but the point is that living on a tell in sixth millennium BC Thessaly would not be the same as living on a tell in sixth millennium BC Serbia, because people at least would have been drawing on different representations of human bodies. However insignificant these discrepancies might have been deemed, they constituted a different framework for life to go on.

So, what was it like to live in such a world, full of miniature models that invoked entities simultaneously present in other matter, other sizes, other colours, and other textures? A point to remember is that perhaps these categories were not impenetrable and allowed cross-cutting and interchanges, as is perhaps arguable on account of the observable hybridization (see also Meskell 2008): heads that are either human or animal; buildings that merge with humans or animals, and vessels that are formed in the shape of humans or animals. The whole practice of miniature modelling testifies to the mingling of categories and the negotiation of ontologies; new entities were modelled each time certain attributes were chosen for representation or left out of it and these entities in turn crafted what it was to be human or animal or anything else in that world (Joyce 2008). Miniatures reiterated and naturalized a certain way of being in the world, as an active body, as part of a wider community of entities, as recognizable through insignia or from the material used, etc. All this was not imposed through grandeur, but would have subtly (re)defined what counted as acceptable and provided the means to account for oneself and others. Their small size, their persistent association with specific materials or their formal attributes, all affected people's lives from particular perspectives, yet this influence would have been anything but minute.

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1. I employ the term 'house model' to keep with established terminology, but I remain uncertain as to the character of these buildings.

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CHAPTER 33

SPONDYLUS GAEDEROPUS/GLYCYMERIS* EXCHANGE NETWORKS IN THE EUROPEAN NEOLITHIC AND CHALCOLITHIC

JOHN CHAPMAN AND BISSERKA GAYDARSKA

INTRODUCTION

The two marine shells, *Spondylus gaederopus* Linné (spiny oyster) and *Glycymeris glycymeris* Linné (dog-cockle), have become famous in global prehistory as prestige exchange items which look very attractive as ornaments and, very occasionally, tools. In the middle Holocene (6500–3000 BC), the Black Sea was too cool and insufficiently saline to support either species (but see [Todorova 2002](#)), but both occurred throughout the Aegean, the Adriatic, and the central and western Mediterranean. The paucity of *Spondylus* ornaments from the Neolithic and Chalcolithic in the two latter regions indicates that the only sources of living shell were the Adriatic and the Aegean (but note finds on coastal sites in Sicily and Malta ([Chilardi et al. 2002](#)), peninsular Italy ([Borrello and Micheli 2011](#)), and Iberia ([Álvarez-Fernández 2011](#))). Fossil *Spondylus* shells, which were brittle and pallid, were only occasionally used in prehistory. Despite limited sources, *Spondylus* and *Glycymeris* shells and products in archaeological contexts indicate an extensive long-distance exchange network covering much of Danubian Europe and beyond, over distances of up to 3,000km ([Fig. 33.1](#)). Less widely appreciated are the dynamic changes in the nature and extent of these exchange networks over three millennia (6500–3500 BC).

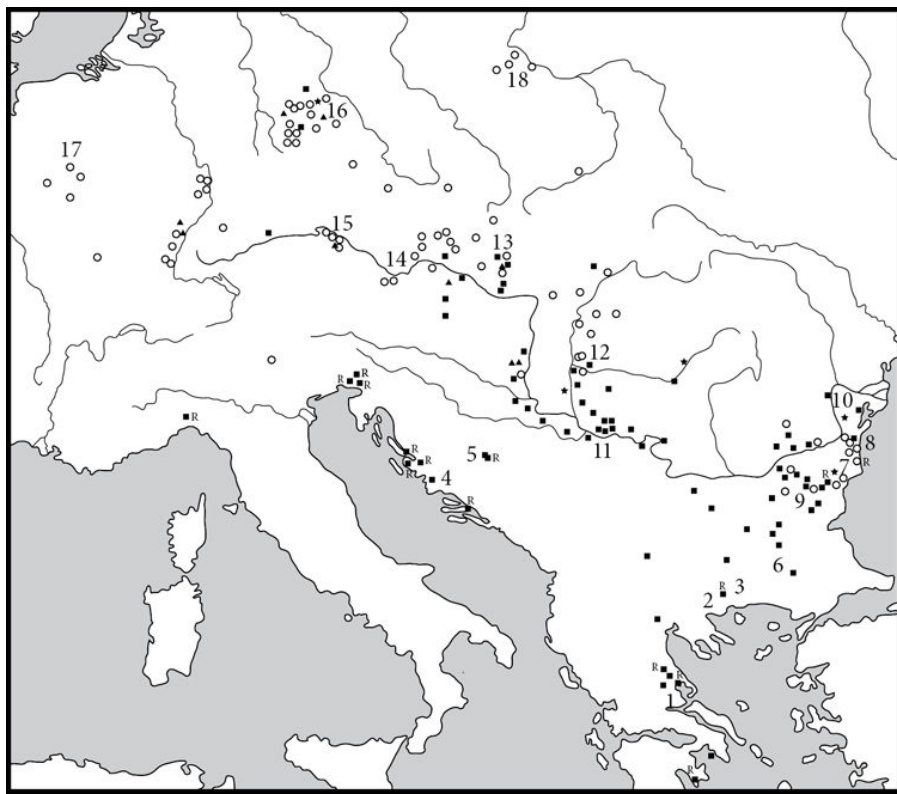


FIG. 33.1. Map of *Spondylus* deposition in Europe, with numbered sites as follows: 1. – Dimini; 2 – Sitagroi; 3 – Dikili Tash; 4 – Danilo; 5 – Obre; 6 – Orlovo; 7 – Varna; 8 – Durankulak; 9 – Omurtag; 10 – Hârşova; 11 – Vršac group; 12 – Battonya; 13 – Nitra; 14 – Emmersdorf; 15 – Aiterhofen; 16 – Bernburg; 17 – Cys-La-Commune; 18 – Brześć Kujawski. Symbols: open circle – grave; open square – settlement or cave; star – hoard; filled diamond – stray find; R – unworked shell.

(After Müller 1997, Abb. 2; re-drawn by Yvonne Beadnell.) Re-drawn by Yvonne Beadnell.

Previous approaches

The history of trade and exchange studies in prehistoric research is dominated by cyclical peaks and troughs, with a decline in interest particularly among post-processualists. More recently, a revival in material culture studies has stimulated new research, which integrates personhood and identity with traded and exotic objects and their relationships to local persons.

Pioneering culture historical studies into *Spondylus* distributions defined the long-distance movement from the Mediterranean into Germany and France. Whilst Buttler (1938) discussed shell sources and defined the main ornament types, Clark (1952) maintained that

the LBK expansion necessitated trade to satisfy a social need established in an earlier phase of their history. Known *Spondylus* finds were mapped and regionally specific ornament types defined (Vencel 1959; Willms 1985; Séfériadès 2003).

In the 1970s, Renfrew (1975) set the processualist agenda for trade and exchange with four claims: the objects of trade could be identified, their sources determined by modern analytical techniques, and quantitative methods permitted generalizations about distribution patterns, leading to inferences about social organization. Shackleton and Renfrew's (1970; Sherratt 1976) isotopic analysis of *Spondylus* objects demonstrated an Aegean or Adriatic origin. Renfrew (1975) identified *Spondylus* exchange as prestige down-the-line exchange for social purposes at special ceremonies, maintaining its separation from other exchange cycles.

Three spatial scales dominated processualist studies: the site, the region, and the pan-European. For the eastern LBK cemetery at Nitra (Pavúk 1972), *Spondylus* ornaments were presented as key exotic goods preferentially buried with mature males (see also Nieszery 1995). Studies of settlement assemblages were rarer, but include Benac's (1973) report on Obre in Bosnia and Tsuneki's (1989) operational chain for *Spondylus* bracelet production, as well as his identification of shell workshops at Dimini. The most detailed report is for Sitagroi, Greece, with operational chain data and a wide series of comparanda (Miller 2003; Nikolaidou 2003; cf. Dispilio, north-west Greece: Ifantidis 2006, 2011, cf. the reports on the Hamangia cemetery at Cernavoda: Kogalniceanu 2012; Mărgărit 2012).

Regional syntheses appeared from the 1980s, including Chapman's (1981) discussion of Balkan exchange strategies and a complex *Spondylus* route in the Vinča culture. Jeunesse's (1995, 1996) research into French LBK burials provided an alternative to the Nitra 'gerontocratic' model by identifying two traditions of status communication—one reliant on *Spondylus* imports, the other on axes and pottery. The Hungarian material was presented and analysed in four studies (Kalicz and Szénászy 2001; Séfériadès 2003; Siklósi 2004; Siklósi and Csengeri 2011), the third in the wider context of Neolithic prestige goods economies.

At the pan-European scale, Müller (1997) estimated the peak *Spondylus* demand of the western LBK at many thousands of shells per annum, mostly for mortuary gifts—a demand met by Adriatic sources via Hungary. Séfériadès (1995) recognized that *Spondylus* shells were valued in central Europe because of their origin in the south-eastern ancestral lands of the LBK communities.

The neglect of trade and exchange in post-processual writing in the 1980s and 1990s stemmed from Hodder's (1984, 26) challenge that it

was ‘impossible to test whether prehistoric artefacts moved from source to destination by exchange from person to person or whether [...] individuals went directly to the source’, implying that trade could *not* be related to social structure. Trade and exchange studies have been partially reconciled with interpretative archaeology, as in Helms’ (1993) research into long-distance specialists and the importance of the exotic in creating local cultural values. The operational chain (*chaîne opératoire*) has been integrated with artefact biographies, in which the birth, life, and death of objects are related to the persons to whom they are enchained in an extension of individuals’ identity (Skeates 1995). Yet a third strand focuses on the practice of deliberately fragmenting objects (including *Spondylus* ornaments) and later re-using their broken parts (Chapman and Gaydarska 2007). Analyses of the Varna and Durankulak cemeteries in Bulgaria, and the settlement at Dimini, Greece, show the differences in the nature of relationships denoted by shell fragments in these contrasting contexts. This more flexible attitude to objects and their relations to people and places suggests that trade and exchange can find their place in an interpretative archaeology—as summarized by Broodbank (1993, 315): ‘Trade may represent only one of several conjunctures between power, distance and knowledge but it provides an invaluable insight into a wider discourse.’ It is to this wider discourse (Broodbank 2000) that we now turn.

PRODUCTION

Spondylus shell procurement is like no other material extraction. The spiny oyster lives at 4–20m depth, and detaching it from its rocky habitat is dangerous and difficult. And yet it was a fairly routine activity as early as the mid-seventh millennium BC for experienced divers. Trawling for *Glycymeris* is somewhat easier but no less dangerous, since the dog-cockle lives in a sandy, muddy habitat 10–40m in depth. Shell-collecting was a seasonal and communal activity, during which divers collected the shells and helpers, perhaps women and children, in boats or shallow waters sorted them and carried them to the beach.

Valued for their shining white colour, *Spondylus* and *Glycymeris* ornaments derived from brown or reddish shells. Undoubtedly, removing their dark and often spiky ‘skin’ to reach the light core was a process of revelation full of symbolic connotations. Although white is the preferred colour, there are numerous ornaments with residual red, yellow, and even green. Other natural features were also an integral part of ornament aesthetics, with deliberate burning used to

show off striking natural lines and garlands against the dark burnished background (Chapman and Gaydarska 2007).

Producing *Spondylus* ornaments was technically demanding (Trubitt 2003). Tsuneki (1989) identified five basic techniques of shell ring production: cutting, grinding, polishing, perforation, and faceting. Since the two valves of the *Spondylus* are of different thickness, protrusions, and colour (Tsuneki 1989), the larger right valve is used either for massive rings (Fig. 33.2/7) or for beads and pendants, and the smaller left ring mostly for fine rings of varying size (Fig. 33.2/8). Other researchers have developed Tsuneki's scheme to cover the whole range of *Spondylus* ornaments (e.g., Tables 33.1–33.2).

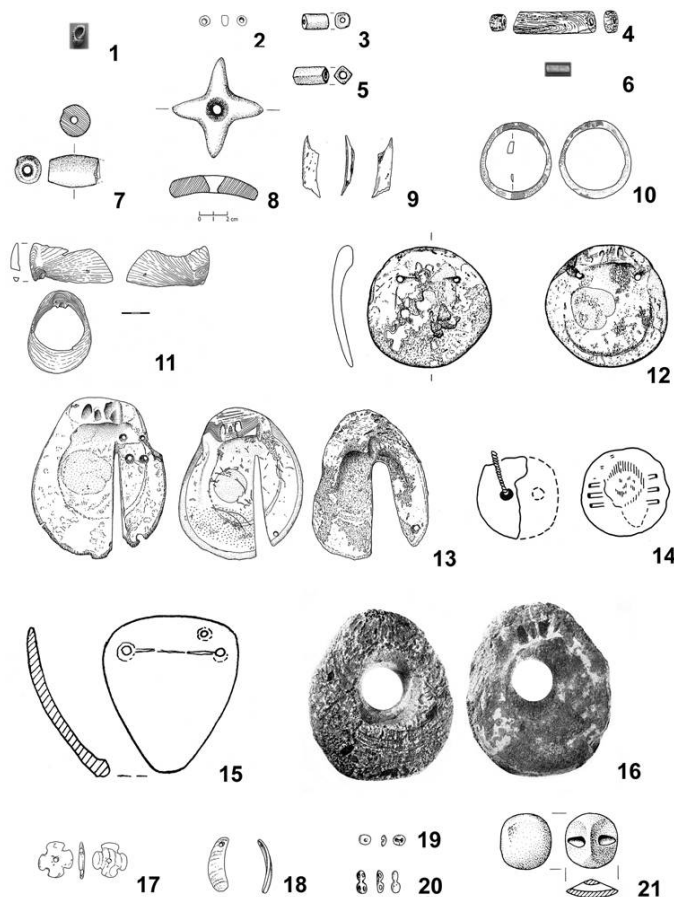


FIG. 33.2. Principal ornament types made of *Spondylus* shell. **Earrings:** 1 – earring; **Beads:** 2 – disc bead; 3 – short cylindrical bead; 4 – long cylindrical bead; 5 – faceted bead; 6 – curved bead; 7 – barrel bead; 8 – star-shaped bead; **Rings (bracelets, annules):** 9 – broken ring; 10 – ring made from thin left valve; 11 – ring made from thick right valve; **Pendants and appliqué/plaques:** 12 – pendant blank; 13 – V-nick pendant; 14 – button-shaped pendant; 15 – triangular pendant; 16 – oval pendant; 17 – clover-leaf pendant; 18 –

appliqué; **Buttons and toggles:** 19 – V-perforated button; 20 – toggle; 21 – conical button.

1, 2, 9, 17, 18, 19, 20: Orlovo Chapman 2010, figs. 3.11–3.12 – 3, 5, 21: Čoka hoard (Raczky 1994, fig. 4) – 4, 12, 13: Aiterhofen (Nieszczy and Breinl 1993) – 6: Varna cemetery (unpublished) – 7, 8: Sitagroi (phases V and II; Nikolaidou 2003, fig. 9) – 10, 11: Durankulak (unpublished) – 14: Rhodochori cave (Rodden 1964, pl. 8A) – 15: Cernica (Comşa and Cantacuzino 2001, fig. 8) – 16: Danilo (Korošec 1959, T. LI/5).

Table 33.1 Generalized operational chain for shell ornaments (after Chapman & Gaydarska 2007)	
1.	Unworked raw material
2.	Partially worked, unfinished objects (blanks, partial smoothing or grinding, half finished perforations, perforations on Stage 1 objects) or the debitage from working
3.	Complete artefacts
4.	Fragmentary artefacts (viz., complete artefacts that have subsequently been broken)

Table 33.2 Miller’s operational chain for <i>Spondylus</i> shell beads (source: Miller 2003)	
Step 1	a bead blank is chipped from the shell
Step 2	the faces of the bead blanks are ground flat
Step 3	the blanks are perforated using bow drill with a chert drill tip
Step 4	the sides of perforated blanks are ground to circle, individually or in groups
Step 5	Polishing

Unworked and partially worked shells (stages 1 and 2) point to possible on-site production and/or storage for further exchange. Complete stage 3 artefacts are certainly the most beautiful, but rarer in archaeological contexts. Stage 4 are the commonest—mostly broken rings, but also the reuse or repair of other stage 3 types.

Finding all four stages of the *chaîne opératoire* is a strong indicator for an ornament production site. This is well documented for the Aegean coast, in contrast to the Adriatic, weakening the claims for a source for LBK *Spondylus* there. The most prominent production sites in Greece are Dimitra (Karali 1991), Dikili Tash (Karali-Yannacopoulos 1992), Dimini, Sitagroi, and Makriyalos (Pappa & Veropoulidou 2011). Apart from Theopetra cave (Kyparissi-Apostolika 1999) and Dispilio, with hundreds of pre-forms (Ifantidis 2006), most of the Greek production sites are within 30km of the sea. A workshop for *Spondylus* ornaments is now claimed for the middle Neolithic levels of the Arene Candide cave, north Italy (Borrello and Micheli 2011). The initial processing of the fresh shell perhaps took place near the beach, where water and abrasives are plentiful. Moreover, there is some evidence that *Spondylus* was used for food (Karali 1999).

Seasonal seafood feasting may have celebrated the successful completion of the dangerous yet prestigious fishing and diving. Stage 4 activities may have been performed where raw material was scarce or *Spondylus* was perceived as part of a constant process of transformation and revelation.

So far, only four claims have been made for Balkan production of *Spondylus* ornaments. The first is the Chalcolithic tell of Hârşova, where a burnt house contained a copper chisel, four awls, and 43 *Spondylus* items (Galbenu 1963), namely the non-conjoinable fragments of at least 19 bracelets—all broken before deposition—and 20 bead rough-outs. Galbenu (1963) interprets the find as a bead-making workshop, using copper tools to recycle shell bracelet fragments. This has not yet been tested by trace-wear analysis, but the beads are too large to derive from the rings; the alternative is a hoard of fragmented ornaments. Similar fragmented *Spondylus* items were found with flint blades, a pumice stone, and bone tools in the Omurtag hoard, north-east Bulgaria (Gaydarska et al. 2004), but there were no traces of working shell on the ‘tools’.

A stronger case for *Spondylus* production is the south-east Bulgarian Orlovo settlement, 50–100km from the Aegean depending on the route (Chapman 2010). Over 700 ornaments, one-third *Spondylus*, were recovered from the surface; the remains of all four production stages strongly indicate local production. Battonya in south-east Hungary has been suggested as the northernmost production site (Kalicz and Szénászký 2001), but no stage 1 or 2 remains are present, confirming Willms’ (1985) conclusion that no site in central Europe shows evidence for *Spondylus* working debitage.

Despite the minimal evidence of inland production, there are many pendant blanks—shells with a rough surface and small perforations (Fig. 33.2/11)—that could equally be stage 2 or 3 objects. They are found at Obre (Bosnia) and Sopot (middle Danube basin), in the Carpathian Basin (Siklósi 2004), and on LBK sites in Bavaria (Nieszery and Breinl 1993) and the Paris Basin (Jeunesse 1995; Kirk 1998). Their minimal transformation could have occurred near their source or at their destination. This ambiguous type leads us into a discussion of the three diachronic stages of *Spondylus* distribution.

DISTRIBUTION

In a general study, it is impossible to grasp the entire variety of *Spondylus* ornaments across Europe (Fig. 33.2 and Table 33.3). There are, however, some obvious preferences and systematic avoidances, resulting in a striking time/space pattern of distribution (Fig. 33.3).

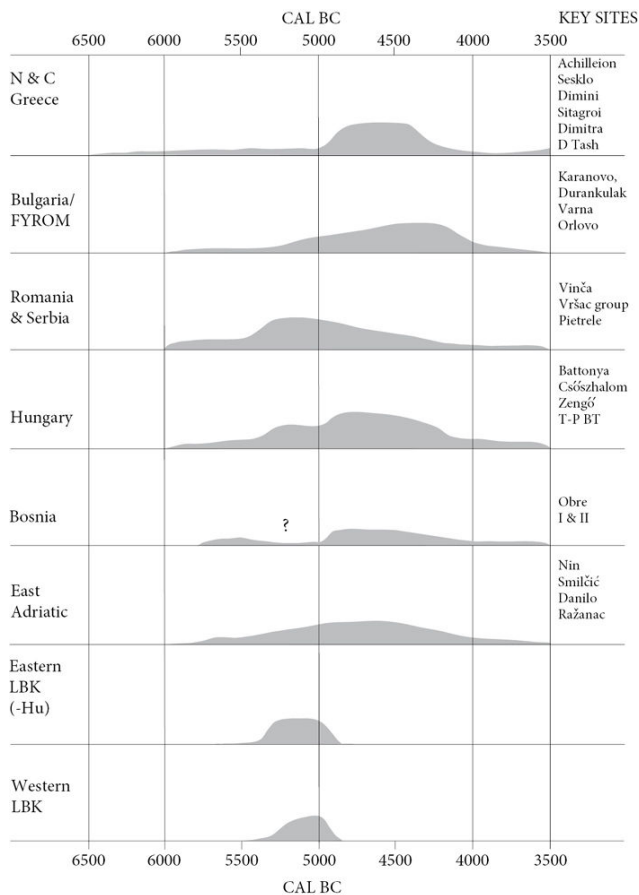


FIG. 33.4. Phases of *Spondylus* consumption by region. The vertical axis schematically represents the relative quantities of shell consumption by region.

Table 33.3 Types of *Spondylus* ornaments

Beads	Rings	Pendants	Appliqués	Buttons	Others
Disc	Thick right valve	V - nick	Arched	V- perforated	Toggle
Short cylindrical	Slim left valve	Shell with 1-2	Another term	Conical	
Long cylindrical	Broken	perforations	for appliqués is		
Barrel	NB Other terms for	Horn-shaped	plaques		
Star-shaped	rings are bracelets or	Triangular			
Faceted	annulets	Oval			
Curved		Button-shaped			
Trefoil		Star-shaped			

In phase 2 (5400–4900 BC), *Spondylus* is widely distributed in Hungary and the east Adriatic. In Serbia, Romania, and the LBK, consumption peaks in this phase. The LBK peak has been explained by the elaboration of ancestral origin myths symbolized by the exotic, south-eastern origins of *Spondylus* (Séfériadès 1995; Whittle 2003).

Similarities between ornaments from the LBK, Serbia, and Romania do support this link, whilst the importance of the Vršac settlements (north-east Serbia) in channelling *Spondylus* into the middle Danube basin supports an Aegean source. There are pendant blanks (Fig. 33.2/12), complete and fragmentary rings, and cylindrical beads (Fig. 33.2/2–3, 9–11). V-nick pendants, disc, and short cylindrical beads are present in the LBK (Fig. 33.2/1, 2, 12); east Adriatic communities preferred appliqués (Fig. 33.2/17). The deposition of some ornament types (Fig. 33.3) indicates regional preferences in shell distribution.

Phase 3 (4900–3500 BC) marks a U-turn from the ‘pan-Danubian’ model of distribution, and a reversion to inter-regional exchange. Post-LBK, there is little *Spondylus* in western central Europe (Müller 1997). Deposition equally declines in Romania and Serbia, with use continuing into the fourth millennium BC (Fig. 33.4). The situation in the east Adriatic is still unclear because of limited excavation data. This demonstrates that the LBK *Spondylus* network ended before the start, rather than the end, of the east Balkan late Copper Age *Spondylus* network (*contra* Müller 1997).

After 4800 BC, *Spondylus* distribution increases dramatically in Greece, Bulgaria, and Former Yugoslav Republic of Macedonia (FYROM), and more modestly in Hungary and Bosnia. There are changes in the types and sizes of ornaments in late Neolithic Hungary, where beads diversify, thin left-valve rings replace thick right-valve rings, and pendants are modified (Fig. 33.2/8–10, 14–16). Bosnian sites contain fragmented rings, pendants, buttons, disc beads and, interestingly, the now ‘archaic’ pendant blank (Fig. 33.2/1, 11, 13, 15). The diversity of *Spondylus* ornament types in Greece, Bulgaria, and FYROM is comparable to the diversity of new personal skills characterizing new types of individuals (e.g. miners, metallurgists, cheese-makers, etc.) emerging in this period (Chapman and Gaydarska 2011). Some forms are found in all three areas (Fig. 33.3), but star-shaped and trefoil beads are exclusive to Greece (Fig. 33.2/5, 8), whilst other pendant types and toggles characterize Bulgaria and FYROM (Fig. 33.2/16–22). Unique types found only in the latter two areas are the curved and faceted beads (Fig. 33.2/6–7: also made in carnelian, Kostov 2007), the climax of Balkan late Copper Age ornament production, probably carried out by specialists.

Only few *Spondylus* items, mainly from Greece, are not personal ornaments. They include the ‘sceptre’ finial from Alepotrypa cave, redolent with social power (Papathanassopoulos 1996, 228, fig. 45); two bird figurines from Zas (Zachos 1999); figurines from Sesklo and Aegina; a bear figurine from Kitsos cave; round spoons from Sitagroi, Saliagos, and Franchthi; burnishers and spools from early Bronze Age Zygouries; maceheads from Dikili Tash (middle Neolithic), Saliagos

(late Neolithic), and Kastri (early Bronze Age); and vases from early Bronze Age Panaghia and Paros ([Karali 1999](#)).

CONSUMPTION

Ornaments are usually associated with living people. In archaeological contexts, the link is more complex (see below), but there can be little doubt that *Spondylus* was worn as jewellery, as part of costume, or ceremonial regalia. Arms, ankles, and necks are the body parts most commonly associated with rings, pendants, and beads; belts and headgear are less frequent. Whilst men, women, and children wore *Spondylus* ornaments, experimental work suggests that most rings could have been worn only by children or placed on the arm during childhood ([Gaydarska et al. 2004](#)).

So far, there are only two areas where *Spondylus* ornaments are entirely related to the living—Greece and the east Adriatic coast—significantly, both areas of the shell's origin. By contrast, in areas furthest from these coasts, such as the western LBK, shell ornaments almost exclusively related to burials ([Fig. 33.1](#)). The few exceptions ([K. Fowler 2004](#); [Müller 1997](#)) cannot overturn this striking difference in consumption. The communities between these two poles were using *Spondylus* in the domain of both the living and the dead (for regional variations, see [Müller 1997](#)). A few key points, however, are noteworthy.

All phase 1 finds from Greece and the Balkans derived from settlements, where intramural burials are rare ([Halstead 1993](#); [Hourmouziades 1979](#)). In phase 2, the late sixth millennium extramural cemeteries provide a new context for increased ornament consumption, as at Botoș, Cernica, Durankulak, and in the Carpathian Basin. One can consider the overwhelming *Spondylus* deposition in phase 3 burials (Bulgaria, Romania, Hungary) as a cultural norm, but the rare *Spondylus* hoards such as Galabnik, Kozludža, Ražanac, Karbuna ([Chapman 2000](#), 246–254), Szekszard-Palanki-hegy ([Siklósi 2004](#)), and Bernburg ([Willms 1985](#)), although differing in number and type of *Spondylus* objects and associated finds, nevertheless identify the shell as a highly valued resource for social negotiation and prestige accumulation outside the burial sphere.

THE ANTHROPOLOGY OF ORNAMENTS

Ornament biography portrays the tension between group values and the personal identity of the wearer. Whilst we can rarely tell if an

ornament or set was created specifically for one individual, once the object(s) become directly associated with one person, a series of discourses opens up about age-sex classes, kinship, status, rites of passage, the exotic, intertribal communication, personhood, and the boundaries of the body (Stig Sørensen 2000). Emphasizing the collective, Newell et al. (1990, 79) propose that ornaments denote group membership and signify a group's internal ordering and structure. For the individual, ornaments are so close to the human body, that they become an indissociable part of that specific social persona (Riggins 1994). Ornaments encode the quality and differential degrees of human-ness, dependent upon a scale of values expressed through style. There will be differences in the value of a fired clay and a shell pendant, or one made of marble. In this way, ornaments are the locus for potential conflict, since cultural priorities are not necessarily accepted by everyone—style is inherently political.

Ornament materials are a visually significant aspect of style, providing insights into the relationship between persons and exotic origins. Ornaments from freshwater molluscs emphasize local place-value and the familiar, those of marine shells highlight the Other and the foreign. Whilst the familiar was part of local identity, materials brought from afar required 'domestication' before safe use so close to the body. The dangers of foreign materials were reduced through transformation into material culture, achieved aesthetically—by creating regular, harmonious forms (Helms 1993), and socially—through the co-emergence of the objects and their contexts of use (e.g. public ceremonies).

In addition, the aesthetics of object colour and brilliance were shared by many Balkan Neolithic and Chalcolithic communities (Chapman 2006, 2007), as well as the LBK. *Spondylus* shells can range from snow-white to deep red through white, off-white, yellow, pink, and red. Grinding and chipping away successive layers constantly reveals new colours which can be selected as the surface colour of the ornament. Surface grinding and polishing, most dazzling in the highly polished bracelets of the Varna and Durankulak cemeteries, contrasts with the dull, pitted, and extremely rough surfaces of LBK pendant blanks.

It is also important to distinguish between a single ornament worn on its own, and a set of multiple elements, which would look out of place if worn singly. The formation of sets opens further possibilities concerning origins and time (Jones 2002; Woodward 2002). Some homogeneous necklaces were formed of items perhaps made from one shell by the same person in one operation. More varied necklaces consisted of beads of different materials from varied sources and perforated by different persons over a much longer time. Moreover,

some beads are worn, perhaps betokening heirloom status, whilst others are in mint condition, seemingly produced shortly before the creation of the set (e.g. in some Varna graves, Chapman and Gaydarska, in prep.). The extreme wear of many *Spondylus* objects in the Paris Basin may be associated with ancestral qualities.

Central to ornament use is their display in the appropriate context, such as a rite of passage. Sets such as necklaces enhance an individual and also partly constitute them, whilst connoting relationships with other persons by sharing matching necklace parts. Those with insider knowledge could read off meaning from the overall form, ordering, and constituent parts of necklaces, thus putting the wearers into a multidimensional social context. C. Fowler (2004, 103) sees personal decorations as changing the nature of the person by providing a new identity, new perspectives, and a different sense of self. This occurs because each artefact provides a relational position for persons in the wider society. Craik (1994) observes that clothes are activated as much by their wearing as bodies are activated by the clothes they wear, and this goes for ornaments, too.

THE PLACE OF *SPONDYLUS* IN WIDER EXCHANGE NETWORKS

Possibly the best summary of Neolithic exchange networks was written 30 years ago by David Clarke (1979, 287): ‘this complex distribution could be sustained only in the context of very active and well-organised systems of interlinked ceremonial gift exchange cycles’. Items included ‘pigs, dogs, axes, shells, teeth, boar’s tusks, ochre, pitch, furs, feathers, amber, beads, bracelets, pots, obsidian, copper trinkets and display gear, selected artifacts and cereals’ (to which we may add ‘lithics’), items ‘required for the continuous rites of passage of tribesmen’s life-cycle’. In this section, we trace the changing configurations of such networks in the three phases of *Spondylus* exchange—the early phase, the LBK peak, and the Greek–Balkan–Carpathian peak.

In the early phase, foragers and farmers widely interact in Greece, the Balkans, and the middle Danube basin, with farmers’ products deposited in foraging sites (e.g. pottery at Lepenski Vir), and lithics with sources outside farmers’ territories (e.g. Szentgál radiolarite, Zemplén obsidian, and limnoquartzites) utilized on farming sites, as well as in foraging contexts in central Europe (Mateiciucová 2004). There is also farmer–farmer exchange (e.g. Adriatic amber to Bosnia). Whatever the nature of the exchange, materials most frequently moved at local scales; this is true of fine stonework for axes and

ornaments, for early copper, cinnabar for pottery decoration, and probably salt. Pottery and figurines were now produced locally (Spataro 2007). However, set against this emphasis on the local is the small-scale ‘domestication’ of colourful, highly polished exotics from 100km or more away (Chapman 2007, table 33.3) One exception is the much more large-scale distribution of Melian obsidian by specialist seafarers as far as Thessaly (Perlès 2001). But, in general, *Spondylus* exchange fits into the exotic aspect of early-phase networks.

During the LBK *Spondylus* peak, farming settlements in north Greece and the Balkans were more numerous and sedentary, occupying a wider range of regions (e.g. the west Pontic zone), including uplands (e.g. the northern Hungarian mountains). The increasing regional differentiation of material culture and settlement trajectories contrasted with the more homogeneous pattern of LBK expansion. In many Balkan cases, such as the Vinča networks, a wider range of materials was exchanged over longer distances, with ‘intercultural’ exchange of pottery, more extensive prospecting, and the consequent utilization of lithics, axe materials, and copper from uplands in every major lowland basin. Typically, Balkan exchange expanded, as seen in the peak of obsidian exchange, now distributed from the Black Sea to the Adriatic, and Poland to northern Greece. However, the distribution of high-quality north-east Bulgarian honey flint and Melian obsidian in Greece contracts. Exotics are firmly established within local cultural value scales.

At least three major long-distance networks supply western LBK settlements—*Spondylus* (from Hungary to the Paris Basin, in Jeunesse’s tradition A burials), Szentgál radiolarite (from western Hungary to Köln, mostly in settlements), and amphibolite axes (from Silesia to Köln, in tradition B burials). The *Spondylus* network is by far the longest prestige-chain, covering between 2,000 and 3,000km. The spatial exclusivity of traditions A and B, with their respective differences in exotics, suggests different networks, contrastive value systems, and even distinct forms of personhood.

The abrupt decline in *Spondylus* in post-LBK communities was not mirrored in Greece, the Balkans, and the middle Danube basin. Instead, the fifth millennium BC represents a climax in the quantity and diversity of material culture deposition, and in certain technologies, notably the production metals, flint ‘superblades’, and highly decorated pottery and figurines (Chapman 2000). The diversity and range of exchange networks also peaks, most clearly seen in copper exchange (Chapman 2000), with products often consumed in spectacular mortuary displays. Obsidian declines in favour of higher-quality materials suited to macroblade production, from north-east Bulgaria and the Prut-Dniester zones. The long-distance exchange of

Szentgál radiolarite was replaced by more intensive mining for local and regional networks. In these contexts, *Spondylus* ornaments regained importance in settlement and mortuary contexts as one of the most attractive costume elements in a huge range of other exotica, including turquoise, nephrite, carnelian, marble, and other marine shells. In the late Neolithic of Hungary, *Spondylus* ornaments were imitated in limestone and local fossil *Ostrea* (Siklósi and Csengeri 2011).

CONCLUSIONS

The rise and fall of the Aegean and Adriatic shells *Spondylus gaederopus* and *Glycymeris* from no or minimal use in the Mesolithic, to Neolithic and Chalcolithic peaks, to sporadic use in the Aegean Bronze Age covers the period 6400–3500 BC. Whilst *Spondylus* typifies the Neolithic desire for bright, colourful, exotic, and prestigious personal ornaments, the variations in use in these three millennia cannot all be explained by such a general notion.

Spondylus ornaments are among a narrow range of exotica ‘domesticated’ through aesthetic codification into several ornament types and deposited on early Neolithic settlements in Greece and the Balkans. Rather than ancestors, these ornaments referenced remote people and places, perhaps through the intermediary of long-distance travellers.

The explosion in LBK consumption of *Spondylus* ornaments north of the Carpathians depended on demand for grave goods to embody connections between the newly dead in a novel zone and the remote ancestors. What the LBK communities traded in return for the thousands of shells required each year is unknown (salt, stock?). The steady increase in *Spondylus* consumption in the Balkans and Hungary relates to three factors: the slow growth of a specific mortuary domain, moderate social differentiation, and the existence of other, tell-based, ways of invoking ancestral presence.

Two of the LBK’s three most popular long-distance items—*Spondylus* and Szentgál radiolarite—virtually disappeared in the now well-established settlement microregions of the post-LBK world, leaving only amphibolite to presence ancestral exchange networks within central Europe. The rapid and extensive growth of the mortuary domain in Greece, the Balkans, and Hungary sustained variable rates of accumulation, to which *Spondylus* ornaments contributed as much as copper and gold. Complete and fragmentary *Spondylus* ornaments concentrate in late Copper Age Black Sea graves without gold and copper. The slow, regionally variable decline in *Spondylus* wearing

matched the decline in all long-distance exchange networks, save those of metal, in the different worlds of the Bronze Age.

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CHAPTER 34

AMBER*

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INTRODUCTION

IN southern Scandinavia, amber was used throughout the Mesolithic and Neolithic. Amber was naturally available only in limited areas along the shorelines of southern Scandinavia and the east Baltic. During the transition to the fourth millennium, large quantities of amber start being distributed over a large area of northern and north-eastern Europe (here defined as Scandinavia, the Baltic region, and north-west Russia).

Amber, as is well known, cannot be dated. Consequently, only a rough chronological classification of objects/shapes based on their various contexts is possible. Therefore, our endeavours to analyse changes in importance and use are, of necessity, relatively simplified. By exploring the handling and use of amber prior to and after the Mesolithic-Neolithic transition, we trace the transformation and cultural expressions connected to amber to gain insight into changing concepts of material culture, personhood, and materiality, transcending the evolutionary frameworks which dominate this period.

MESOLITHIC AMBER AND PERSONAL ADORNMENTS

From the Mesolithic onwards, amber is relatively rare. Its distribution is generally limited to regions close to natural deposits.

According to Lars Larsson, Mesolithic amber was predominantly used in its natural form and generally only minimally worked with minor alterations of the surface. At most, holes are drilled to make the amber easier to hang or to attach to clothing. From Skateholm in southern Sweden, there are some examples of amber as grave good (Larsson 1988, 2001). In cases with more advanced working/

decoration, the resulting object is always based on an animal motif (Larsson 2001, 68). Four of the eight Mesolithic zoomorphic figurines from Denmark depict bears (Larsson 2000; Mathiassen 1960; Vang Petersen 1998). Carved decoration can occur on these figurines and on simpler pendants (Andersen 1981). It usually consists of tiny hollows or lines in geometric patterns or 'fringes' (Mathiassen 1960).

In contrast to the rarity of amber objects, Mesolithic burials from the Baltic area and south Scandinavia reveal a great variety of adornments made from perforated animal teeth and shells, used as pendants, headgear, necklaces, strings, and on garments (Kannegaard and Brinch Petersen 1993; Larsson 2001; Zagorska 2004; Zagorskis 2004). On a very general level, Mesolithic personal adornments systematically reference and make use of the natural world to negotiate and express personhood, material objects, and relations to nature (cf. Fowler 2004, 132–39). Even though there is much variation in the number, types, and position of grave goods, neither age, gender, nor status differentiation seems well marked or standardized (Blankholm 2008, 124–26).

TRANSITIONS

The transition to the Neolithic saw significant changes in the working of amber and the traditions connected with this material. Large quantities of amber now appear in different contexts in southern Scandinavia, the Baltic area, southern Finland, and the north-western regions of Russia. Although less frequent, amber was now distributed as far north as the White Sea and northern Fennoscandia. This extensive distribution can be related to a dramatic expansion in long-distance exchange networks reaching northwards from both sides of the Baltic Sea. In spite of the great distances involved, the radiocarbon dates from many burials are virtually identical throughout northern Europe, giving crucial insight into the instrumental use and importance of amber early on.

For instance, at Dragsholm in Denmark, only 2m from a late Mesolithic double burial of two women rich in animal tooth pendants, a flat male inhumation from the very beginning of the early Neolithic, with 60 amber beads, a greenstone battleaxe, nine projectile points, a bone wrist guard, and pottery has been documented (Price et al. 2007; Brinch Petersen 2008).

In the large Latvian burial ground of Zvejnieki, in the 315 graves dating from the seventh to the third millennium BC, amber replaces the animal tooth pendants prevalent in earlier graves (Zagorska 2001, 121; 2006, 9–94; see also Taffinder 1998, 57ff). Whilst irregular and

naturally shaped amber pieces are found in Baltic votives, settlement sites, and workshops, these are not common ornaments in graves, which mostly contain pendants, beads, and various dress ornaments (Zagorska 2001, 121; see also Bērziņš 2001; Loze 2001).

From the Baltic region, amber was redistributed throughout the first half of the fourth millennium in the sub-Neolithic Comb Ceramic complexes of Karelia, Finland, and north-west Russia, where pendants and especially beads in graves are frequent, ranging from a dozen to several hundreds (Halinen 1999, 173ff; Torvinen 1978; Oshibkina 2001; Loze 2001; Zhulnikov 2008; Zimina 2003; Katiskoski 2004).

A few amber beads are known from different contexts at settlement sites along the coast of the Barents Sea in Arctic Norway, including in burial cairns dated to the very early fourth millennium (Ramstad 2006, 2009). These amber finds are more than 2,000km from their natural sources. A few burials with contemporary early dates and amber beads are also known from the northern regions of Finland and Sweden (Halén 1994, 171).

These examples illustrate strong affiliated depositional practices and usage of amber in roughly contemporary burials found over the larger northern European landscapes. The large number of amber in some graves seems to indicate a more direct focus on individuality than in the preceding Mesolithic. Depositing amber objects within particular monuments at settlements sites or in their close vicinity, such as burial cairns and longbarrows (Price 2000, 277; Ramstad 2006, 141; Blankholm 2008, 129; see also Olsen 1994, 82–84; Núñez and Okkonen 2005, 26), represents a transition in the relationship between people, material objects, and settlements, and seems to indicate societies with new sets of engagement, and display, of individuality.

The widespread use of amber confirms that the transition to the fourth millennium BC was characterised by an intensification and consolidation of extensive networks (e.g. Price 2000; Núñez and Okkonen 2005; Zvelebil 2006; Damm 2006). Long-distance trade involving artefacts of non-local origins is one element in new concepts of power and prestige, whilst the importance of amber in burials may indicate systems of ceremonial exchange (Zhulnikov 2008).

AMBER AND SOCIAL ENVIRONMENTS IN NORTHERN EUROPE

Long-distance movements of objects indicate a significant degree of social interaction and information flow between groups living at different localities in different regions. Amber exchange most likely

created ties and commitments, and thereby a sense of integration and shared values amongst different societies in northern Europe. Moreover, the amber objects themselves may, by their sole appearance and effect in different social environments, have shaped or moulded new social conditions in the societies they reached.

Since the circulation of goods also informs us about a society's dominant cultural values ([Appadurai 1986](#)), the introduction and widespread use of amber during this period cannot be separated from its historical, cultural, and social context. The questions being asked are: what underlies the demand for amber, what does the development of these new exchange networks reveal about social values, and to what extent are old and new ideas about material culture, personal adornments, and social identities being restructured?

Over large parts of northern Europe, the transition to the fourth millennium marks a period when older Mesolithic systems seem to undergo profound structural changes. Southern Scandinavia witnessed the introduction of farming and a 'Neolithic package' through the establishment of the Funnel Beaker complexes. Hunting and fishing continued as main subsistence strategies around the Baltic (middle Neolithic Narva complexes) and the regions further to the north (middle sub-Neolithic Comb Ceramic complexes covering northern landscapes of the Baltic, Finland, and north-west Russia; Aceramic Slate complexes in central and northern parts of the Scandinavian peninsula). For these regions, a Mesolithic prolongation in spheres such as subsistence can be argued. However, there are notable changes in economic strategies, material culture, and symbolic and ritual expressions. At a general level, a shift from mobile towards more sedentary settlement patterns occurs amongst different indigenous forager complexes in the central and northern parts of northern Europe. In regions like Fennoscandia these changes were manifested by clusters of semi-subterranean houses in village-like arrangements, which together with intensification of accumulated cultural layers, burial cairns, and heaps of fire-cracked rocks (in tons) mark the transition towards a more 'built' environment than that of the Mesolithic ([Olsen 1994](#); [Lundberg 1997](#); [Pesonen 2002](#); [Núñez and Okkonen 2005](#); [Damm 2006](#)).

Although differently caused and expressed across the mosaic of culture complexes in northern Europe, deep-rooted transformations of ideology, rules, and restrictions seem to occur. This must also have affected conceptions of personhood and individuality, as well as social boundaries and group affiliation, all probably now defined by new means of social control.

As a number of studies have addressed, valuables such as amber represent more than just commodities; they were passed from hand to

hand over large areas through different spheres of use and meaning. Thus, value was not only inherent to the object itself, but also intimately associated with the relations of which it formed a part (e.g. [Thomas 1996](#); [Gosden and Marshall 1999](#); [Fowler 2004](#)). Life histories hence also extend to material objects. By accumulating time and history, movement and exchange, objects and people were constantly transformed and increasingly enmeshed with each other. Thus, the amber beads are not only an exotic raw material, but just as much appreciated for the 'exotic and/or valuable' life histories they gathered. Consequently, amber objects probably meant different things to different people, and were ascribed new meanings in different cultural environments. Despite this, there are also shared conceptions in the initial Neolithic use of amber as grave goods in the different regions, most notably the relation to individual adornment.

But what made beads such a suitable medium for exchange? Due to their visibility and their ability to communicate and display, beads in general are one of the most common items in exchange systems. Moreover, they are durable, small, and therefore easily transportable ([Graeber 1996](#), 4–5). As part of composite objects (such as necklaces and display clothes), beads have the added advantage of being divisible into smaller exchangeable units. Whilst it is difficult to estimate the size and number of beads which may have formed a composite object during production or composition, burials in south Scandinavia, the Baltic region, and north-west Russia contain necklaces and clothes with everything from a few to several hundred beads ([Larsson 2001](#); [Zagorska 2001](#); [Zimina 2001, 2003](#)). Thus, if the beads were circulating as composite objects, some of these may have been of considerable size.

The possibility of disentanglement from an original composite object enhances a bead's mobility and distributional radius, which partly explains the wide distribution of amber beads during the transition to the fourth millennium BC, specifically northwards from the natural deposits (e.g. [Ramstad 2006](#); see also [Woodward 2002](#)). As the beads went through sequences of exchanges, one can imagine not only the fragmentation of composite objects, but also the rearrangement and reunions with other beads making up mixed narratives and new hybridizing networks ([Fowler 2004](#)). The single bead was thus layered with the symbolic values from different necklaces, as well as its own accumulating narratives. Through fragmentation, amber beads could also have extended uses and biographies as heirlooms, allowing single beads to circulate through many generations and over long distances (e.g. [Woodward 2002](#), 1040; [Ramstad 2006](#), 143). In the following, we discuss selected case studies to illustrate the changing ways in which amber was bound up

NEOLITHIC AMBER IN SOUTHERN SCANDINAVIA—AN OVERVIEW

During a first, *early Neolithic phase*, amber ornamentation is complex, with large numbers of beads forming elaborate necklaces, often with several parallel rows. The beads themselves are of relatively simple geometric shapes separated by flat pieces (plates) acting as spacers (Becker 1953; Ebbesen 1995). One interpretation is that beads were accumulated and then used as votive deposits, their number rather than their specific shapes being the principal criterion. Whether this was a joint project or in the hands of a few people in a central position is unknown. However, regardless of how the work was organized, the handling and votive offering of amber were likely surrounded by rules calling for a remarkable collective effort. Amber was part of the same types of acts as other objects—votive offerings could for instance also involve flint axes and sometimes ceramics (Becker 1948; Karsten 1994). These offerings are mainly known from Denmark and are rare in Sweden.

A *second Neolithic phase* in the late early and middle Neolithic sees the use of amber with burials in megalithic graves. Bead shapes are now very varied, even if some dominate the repertoire. Principally, the shapes may be interpreted as miniature representations of clubs and double-edged battle axes. However, there are also shapes for which we have no comparisons. Beads are now individual objects associated with individuals, as they are found singly next to buried bodies (Sjögren 2008). In addition, the votive offering of amber in wetlands continued, but smaller offerings of individual beads or small collections replace the earlier large quantities and composite objects (Cederschiöld 1953; Axelsson and Strinnholm 1999).

This second phase could be described as one of ‘common forms of individualized use’. Shapes are more varied than before, but the amber occurs as individual objects with their own history. Nevertheless, it is significant that the beads mainly occur as personal objects in a burial context, both in the megaliths and the flat (earth) graves of the period (Runcis 2002).

In the *third phase*, the late Neolithic/early Bronze Age, the quantity of amber declines sharply and the complexity of forms simplifies. Miniatures disappear almost completely and amber is shaped into simple clothing accessories such as buttons or ornamentation. Miniatures still occur in cists, but their frequency is considerably lower. With the increasingly widespread use of bronze over the

following centuries, the use of amber for ornamentation seems to entirely cease. Amber is no longer a personal or a common object with a symbolic meaning. Finds from this period in Scandinavia are mainly in the form of unworked nodules, probably collected for exchanges with contacts outside the region.

MEGALITHIC AMBER IN SWEDEN

Amber beads are among the most frequent finds from megalithic burials in Scandinavia. However, research traditionally focused on the pottery found outside the entrances of passage graves, to the detriment of other find categories. There are a few studies on Danish votive offerings ([Becker 1948](#); [Rech 1979](#); [Ebbesen 1995](#)) and on the Swedish material from megaliths and hoards ([Taffinder 1999, 2001](#); [Anderbjörk 1932](#); [Cederschiöld 1953](#); [Ebbesen 2002](#); [Axelsson and Strinnholm 1999, 2000, 2003, 2005](#)).

In Sweden, passage graves occur in the regions of Skåne, Halland, Bohuslän, and Västergötland. Of the c. 400 known passage graves, around 260 are in central Västergötland. Quantitatively, middle Neolithic amber is dominated by the finds made in passage graves. This is probably due to the archaeological methods employed and the good preservation conditions in the chambers of passage graves. However, the material varies in composition, scope, and degree of preservation, mostly due to the circumstances of excavation. Most passage graves in, for example, Västergötland were investigated in the nineteenth century. The focus then was on skeletal material rather than amber and other finds. This, and the choice of excavation methods, means that the material's representativeness can be questioned.

[Axelsson and Strinnholm \(2003, 2005\)](#) catalogued all the amber from Swedish megalithic graves and constructed a classification system dividing the amber beads into ten groups (with subgroups) based on their shape. An overview is provided in [Table 34.1](#) and [Figure 34.1](#). Using this system as an analytical tool, differences can be noted at both regional and local levels ([Axelsson and Strinnholm 2003](#)). Regionally, the incidence of beads in the shape of double-edged battle axes and clubs varies. Together, these two categories represent about half the total material in Sweden. In the Skåne megaliths, 11% of the beads are shaped as double-edged battle axes and 42% as clubs. The figures for Västergötland are 29% and 21% respectively. Otherwise, the bead percentages are broadly similar in both areas ([Fig. 34.2](#)).

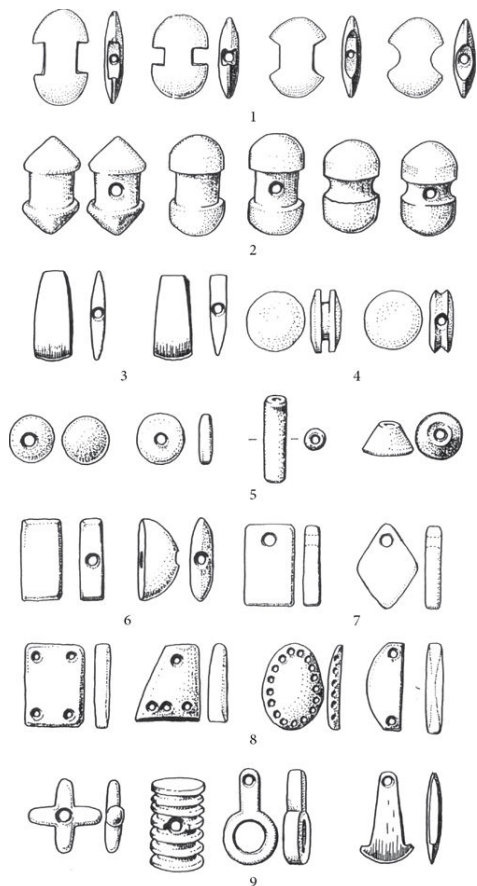


FIG. 34.1. Examples of the different bead types. Numbers refer to the groups in the classification system—(1) double-edged axes (2) clubs (3) flint axes (4) bobbins (5) rounded beads (6) other geometric shapes (7) pendants (8) plates (9) other shapes.

(Drawings by Andreas Åhman).

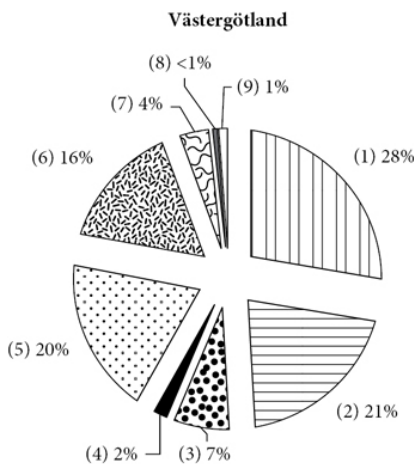
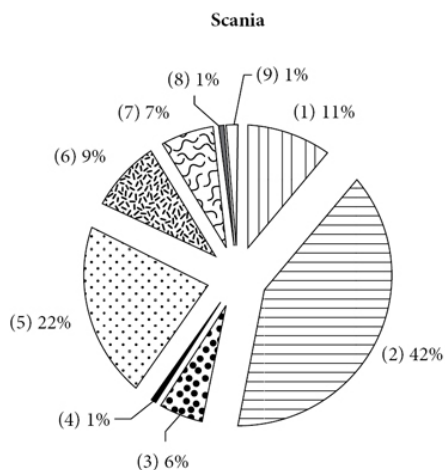


FIG. 34.2. The frequency of different types of beads from megaliths in Skåne and Västergötland. (1) double-edged axes (2) clubs (3) flint axes (4) bobbins (5) rounded beads (6) other geometric shapes (7) pendants (8) plates (9) other shapes.

Table 34.1 The ten different groups of amber beads	
1. a-d	Beads shaped like double-edged axes
2. a-d	Beads shaped like clubs
3. a-c	Beads shaped like flint axes
4. a-b	Beads shaped like bobbins
5. a-c	Rounded beads
6. a-d	Other geometric shapes
7. a-f	Pendants
8. a-d	Plates
9. a-k	Other shapes
10.	Fragmented, impossible to classify

Local differences are also observable between passage graves. As the number of burials varies, it is not surprising that there are differences in the numbers of amber objects. However, as knowledge of the burials is often poor, the differences in the number of various bead types cannot be discussed in detail. Broadly speaking, it can be stated that there is variation. However, differences are evident for some of the larger assemblages. Skåne’s two largest amber finds come from the passage graves of Kvistofta 12 (322 beads) and Barsebäck 3 (353 beads). An exceptionally high proportion (65%) of the Kvistofta finds were club-shaped beads. The proportion of beads shaped like double-edged battle axes (18%) and like flint axes (2%) was also above the average for Skåne. The Barsebäck assemblage broadly corresponds to the average in Skåne—double-edged battle axes 10% and clubs 37%. However, at 10%, the Barsebäck grave shows more than the average proportion of beads shaped like flint axes. In Västergötland, two of the largest finds come from the passage graves Hjelmars Rör 3 (113 beads) and Karleby 59 (117 beads), even though excavation at Karleby 59 is still ongoing. With only 9% battle axe-shaped beads, the assemblage at Hjelmars Rör differs from that of other passage graves in Västergötland. In contrast, for Karleby 59, the proportion of beads shaped as double-edged battle axes (32%) is much higher than for other passage graves. Conversely, the proportion (10%) of club-shaped beads is well below average.

AMBER—SOCIAL PRACTICE AND THE FUNNEL BEAKER CULTURE

The amber in passage graves raises issues as to the role of such graves

in Neolithic society. It also once again sets the spotlight on concepts such as culture and Funnel Beaker culture. The material from the passage graves shows that there are similarities and differences at both the regional and local levels. It is probably not the case that local groups had access to different trade/barter networks with contacts in amber-producing regions. Rather, differences probably result from small variations in traditions (perhaps connected to identity and/or lineage groups) regarding the social use of symbols. It is interesting to bear in mind that the amber and flint used in Västergötland most likely originated in Skåne or Denmark. Whilst both products probably circulated in the same social and economic networks, some shapes or symbols may have been in greater demand or were not allowed to circulate in the same quantities as others ([Axelsson and Strinnholm 2003](#)).

An interesting connection exists between amber and early copper working. Beads shaped like miniature copper axes are found throughout southern Scandinavia in the *early Neolithic phase*. These were originally interpreted as thin-butted flint axes ([Ebbesen 1995](#), 40), but it has since been argued that they actually represent early copper axes ([Taffinder 2001](#), 104). Copper axes are well documented in the early Neolithic ([Klassen 2000](#); [Magnusson Staaf 1996](#)). Even as miniatures, their form is easily recognizable. A further possible connection between Neolithic amber and early copper working are the club-shaped beads, which are amongst the most common types in megaliths. Their closest equivalents are the ‘stone tools with shafting grooves’ (*Steingeräte mit Rille*) found throughout southern Scandinavia and connected with early metalworking ([Indreko 1956](#); [Janzon 1984](#)). A similar relationship (clubs, bead miniatures, and megaliths) exists in Ireland, where the connection with early metalworking is certain ([Herity 1974](#)). It is particularly interesting to note the regional differences between Skåne and Västergötland, with clubs considerably more common in the Skåne megaliths. Neolithic copper finds are almost non-existent in Västergötland.

The changes relating to amber also reflect a number of other transitions. Amber initially served as a social collective resource handled via centralized structures and combined into large, complex ornaments. These can be assumed to ‘represent’ a large group of people who jointly contributed to ornament creation, either inspired by a central organizing force or, perhaps less plausibly, by spontaneous joint commitments. To a certain extent, this follows the pattern that [Per Karsten \(1994\)](#) noted for votive offerings during the first part of the early Neolithic, i.e. that offerings were mostly not ‘accumulated and collective’, but individual items deposited by individuals. The collective element here is not in the offering, but at

an earlier stage, in the handling of the amber.

The role of amber changes in the *second Neolithic phase*. Here, amber is principally found in connection with megalithic burials, as individual personal items following their carriers into the grave or given to them at burial. There is also now a clear increase in the variety of forms, although bead miniatures dominate. We can also imagine that beads, their sharing and combination, related to personal biographies.

In the amber from passage graves (and a few votive deposits), many beads show secondary holes, traditionally interpreted as attempts to mend broken pieces (cf. [Cederschiöld 1953](#)). From the Falbygden area, there are two known finds of votive deposits, originally interpreted as one hoard with a partly misattributed location ([Cederschiöld 1953](#)). The reason for this interpretation was that one amber bead was found in two halves, one in each deposit. However, this is not the sole possible interpretation. Amber beads may have been deliberately split into two. This is supported by the fact that holes do not occur equally frequently on all easily broken bead shapes (i.e. types 1, 3, and 6), as would be expected if holes were attempts to mend broken objects. If, on the other hand, amber beads were deliberately broken and perhaps shared between individuals or groups, other interpretations are possible. Drilled holes could then have been used to hang 'broken' beads or to attempt temporary 'reunions' ([Axelsson and Strinnholm 1999](#)). These beads could have functioned as symbols of relations and belonging, whilst the meaning associated with some shapes made it 'impossible' to split them in half. If symbolic value and use were more important than durability, it is not surprising that the frequency of drilled holes differs between different bead types.

These differences and treatments indicate a complex use of amber in the Neolithic. Beads may have been symbols and tokens of relations even where raw material was not naturally available and its origin possibly unknown. Interestingly, beads in the shape of double-edged battle axes also occur in the context traditionally classed as Pitted Ware culture ([Burenhult 1997](#); [Janzon 1974](#); [Malmer 2002](#)), once again showing that the traditionally defined Neolithic cultures are not homogeneous, but have fluid and diffuse interfaces. For instance, miniature amber double-edged battle axes occur in both Funnel Beaker and Pitted Ware contexts, although the Pitted Ware culture is not traditionally associated with megaliths (cf. [Strinnholm 2001](#), 92–94).

AMBER, MATERIALITY, AND THE EVOLUTION OF NEW SOCIAL CONFIGURATIONS

Adornments constitute a powerful marker of social identity and can serve to define differences between people and for individual expression. Both were important in a situation where tradition and cultural values in indigenous societies over larger parts of northern Europe were exposed to varying degrees of internal tension and stress. As [Wright and Garrard \(2003, 277\)](#) emphasize, the combinations and rearrangements of individual beads enable the definition of non-verbal messages conveying an individual's position within a social environment. This potential is increased by the beads' varying 'prestigious genealogies' and hence their differing degrees of symbolic density (cf. [Weiner 1994](#)).

However, by solely focusing on amber as a reflection of changed social and economic relations, or on important cultural transitions such as the introduction of farming, one overlooks the material transformations amber undergoes, and thus its own importance in moulding these processes (cf. [Olsen 2003, 90](#)). Returning to Larsson's statements about Mesolithic amber, he notes a common underlying practice in amber processed after 4000 BC, whereby there is a rapid change from utilizing only the natural surfaces of amber to stylistically shaping it to the point that it no longer portrays nature, but contrasts with it. These standardized forms are an indication that Neolithic amber refers to radically different sets of identities than during the Mesolithic ([Larsson 2001, 69](#)).

Amber was not the only material undergoing these kinds of transformation. Affiliated conceptions were expressed in several other objects during the same phase. In exchange systems, a variety of other polished, 'artificial' objects moved in different directions, such as polished rectangular flint axes (from southern Scandinavia and northwards) and basaltic adzes and axes (from central parts of Scandinavia), alongside slate daggers, knives, and spearheads (northern Scandinavia and southwards) ([Taffinder 1998](#); [Bergsvik 2006](#); [Ramstad 2006](#); [Zvelebil 2006](#); [Hallgren 2008](#)). These changes in material culture around the transition to the fourth millennium are not simple chronological stages, but embody a new material rationality and logic, implicated in the carving out of new social configurations.

However, amber had a distributional radius and involved quantities that no other material could match. Being rather malleable, amber could be polished into an infinite number of abstract forms. Furthermore, the lack of reference to the natural world made it possible to establish a new grammar related to social identities, objects, and materiality.

The changing role of amber during the Neolithic and early Bronze Age is not only attributable to a change in aesthetics or fashion. The

transition from votive deposits in wetlands and megaliths to a commodity shows a changed view of amber's importance. It is tempting to interpret this as a process in which amber changed from an *inalienable* object, a symbol and token of relations, to a *commodity* that could be circulated and exchanged throughout wide areas (for general concepts, see Bloch 1989; Godelier 1999; Weiner 1992). The barter of amber beads had become possible, as the beads' symbolism had lessened and personal connections to the objects were reduced.

Amber is present in vastly different cultural contexts, from the hunting and fishing communities of Arctic Norway to the early farming communities of south Scandinavia, and across a vast area. Transformations in the use of amber and related materials are thus more than a reconstruction of older symbolic and ritual systems as a result of the Neolithic 'Zeitgeist' (e.g. Hodder 1990; Bradley 1997). Amber was one means of embodying a whole new practical logic. Beads could be fragmented, rearranged, taken out of circulation in burials or hoards, or distributed hundreds of kilometres beyond their places of origin. As part of exchange systems, even a single bead had the potential (through its form and biography) to affect older traditions. As such, the distribution of amber beads represents more than just the flow of symbols of excellence, a new form of adornment, or a response to altered social conditions, but rather expresses a different form of material logic with long-lasting effects in the Neolithic of northern Europe.

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CHAPTER 35

THE FIRST METALWORK AND EXPRESSIONS OF SOCIAL POWER

VOLKER HEYD AND KATHARINE WALKER

INTRODUCTION

METALS have certain distinctive properties which seem to have appealed to European Neolithic and later communities: brilliance, magical transformations behind their creation, and potential for re-melting, re-casting, and re-modelling. They were also valued for their colours: gold for the sun high on the horizon, copper for the setting sun or the blood of life, and silver for the moon. In the formative years of metallurgy, copper and its ores appear to have held primarily aesthetic roles as cosmetic colours, beads, and other personal adornments. They are likely to have been recognized as rare and precious, and were later mobilized in social differentiation. The adoption of metals altered economies and social relations, and triggered craft specialization. The roots of social differentiation were already present in some Neolithic communities, yet the uneven distribution of metal ores, like certain types of stone already, became elements in long-distance exchange networks and eventually trade. This paper attempts to go beyond simplistic ideas of metals in social stratification: it presents a more complex picture, outlining similarities and differences geographically in the presence and role of metallurgy during an early, middle, and late Copper Age.

THE EARLIEST METALLURGY IN EUROPE: A NEAR EASTERN ORIGIN?

The origins of metals can be found in the zone from which farming and animal husbandry came: the so-called ‘Fertile Crescent’ and adjacent Anatolia, the westernmost protrusion of Asia, comprising the majority of modern-day Turkey. Powdered copper was used for cosmetic purposes at several sites including Jericho in Palestine, Nehal

Hermar in Jordan, and Hallan Çemi in Turkey. A copper-rich pigment, diopside, a copper silicate, was used also on some of the earliest statuary at Ain Ghazal, Jordan (7200–5000 BC) (Rollefson et al. 1985; Rosenberg 1999; Cleland et al. 2004). The earliest actual copper object to be discussed in print is an almond-shaped pendant with two perforations from Shanidar Cave, northern Iraq, said to date to the earliest ninth millennium BC (Solecki 1969, 311–314; Matthews 2003) although its chronological attribution is doubtful. The first clear evidence for the use of native copper in the production of trinkets comes from around the transition of Pre-Pottery Neolithic A (c. 8500–7600 BC) and Pre-Pottery Neolithic B (c. 7600–6000 BC). Slightly later copper artefacts are also known from Iran (Stech 1999).

The objects appearing at the Pre-Pottery Neolithic B sites of Çayönü Tepesi and Nevalı Çori, both in Turkey some 100km north-west of Shanidar Cave, are made from hammered native copper (Yalçın 2000). More than 100 copper objects, mostly oval-shaped beads, but also pins, fish hooks, awls, and a reamer indicate a proficiency of craftsmanship existing as early as the eighth millennium BC. Çayönü Tepesi has revealed some of the earliest attempts at working native copper with heat, instead of cold-working it, suggesting that people may have ‘begun to sense the properties of metal as *metal*, rather than as some peculiar kind of stone’ (Özdoğan and Özdoğan 1999, 13; see also Maddin et al. 1999). At Aşıklı Höyük in Turkey, a Pre-Pottery Neolithic B settlement slightly later in date, beads made from heat-treated native copper were also found (Esin 1999). Nearly all of them came from in-house burials. Çatal Höyük is another Turkish site which yields copper artefacts from the seventh millennium BC (Mellaart 1967, 217–218, pl. 104; Cessford 2001), as well as beads dating to 6400 BC, originally identified as lead but later found to be galena, a lead sulphide ore, rather than metal (Sperl 1990).

It is the ‘reduction process’ achieved through the roasting of ore with charcoal, the addition of further heat, and finally casting which transforms ores into brilliant metals, and marks the beginning of metallurgy proper. This stage, not yet reached for the famous Can Hassan copper macehead, dated to c. 6000–5900 BC, must have developed in the centuries thereafter; by c. 5000–4900 BC it is finally realized as shown by the copper flat axes from Mersin-Yumuktepe, layer XVI (Yalçın 2000).

In Europe, there is considerable evidence that metalworking origins followed the same general pathway, albeit with a later chronology. So, the earliest discoveries of hammered native copper from Moldavia (Markevich 1974, 14), Romania (Comşa 1991), Hungary (Kalicz 1992; Zalai-Gaál 1996), and Slovakia (Nemejčová-Pavuková 1995) date from the later sixth millennium BC. There are also late Hamangia copper

objects of adornment ([Pernicka et al. 1997](#)) and early copper chisels from Maritza-period contexts (first quarter of fifth millennium BC) at Catalka ([Todorova 1981](#), 53) and Drama ([Moesta 1991](#)) in Bulgaria. These are still hammered, with heat applied at least for the Drama chisel. The step towards metallurgy proper, and casting of heavy tools, seems then to have happened at the transition from the first to the second quarter of the fifth millennium BC. However, recent analyses from the Vinča site of Belovode, Serbia, perhaps indicate a much earlier date for the start of processing ores and casting at least smaller objects in Europe (Ernst Pernicka, pers. comm.; [Radiivojević et al. 2010](#)). This implies that the Near East and Europe may have developed similar technological steps simultaneously, or one not long after the other, but it is probable they would have done this independently as has long been suspected.

THE DEVELOPMENT OF METALLURGY IN SOUTH-EASTERN EUROPE

The Copper Age, Chalcolithic, or Eneolithic is based on different criteria in the archaeological traditions of different countries. This obscures supra-regional patterns. In Bulgaria, for example, the early ‘Chalcolithic’ during the first half of the fifth millennium BC fails to produce securely attributed cast heavier tools or axes, nor is there evidence for ore extraction and metal reduction beyond local activity. Countries like the Czech Republic, Austria, and Poland, with numerous copper artefacts in their record from c. 4500–2200 BC, did not even use the term ‘Copper Age’ until recently. In Bulgaria, a ‘Proto Bronze Age’ begins at c. 3600 BC ([Nikolova 1999](#); [Vajsov 2002](#)), totally replacing, terminologically, the later years of the Copper Age. This also exists for Greece, where the beginning of early Helladic and Cycladic I is set conventionally at c. 3200 BC ([Manning 1995](#)), and for the Ukraine and southern Russia with their Yamnaya ([Rassamakin 1999](#)). Hungary defines its early Bronze Age I at c. 2700 BC with the emergence of the Makó/Kosihy-čaka and early Somogyvár ([Ruttkay 2003](#)) cultural complexes to which the Vučedol entity can be attributed, although perhaps starting two centuries earlier. The same archaeological cultures are, however, named ‘Final Eneolithic’ in Serbia and Croatia, ‘Endneolithikum’ in Austria, and ‘Transitional Period’ in western Romania. Given these differences, the best way to provide a comparative framework is to propose a south-eastern and central European early (c. 4600–3600 BC), middle (c. 3600–3000 BC), and late Copper Age (c. 3000–2500/2200 BC). Each of these horizons is defined by underlying cultural entities and by its characteristic

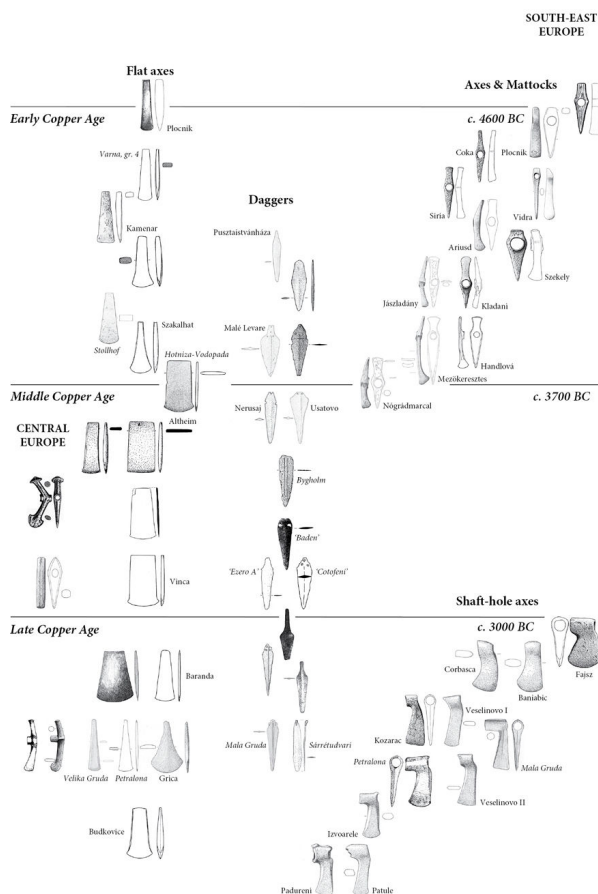


FIG. 35.1. Chrono-typological chart of early copper axes and daggers (axes after [Vulpe 1970](#) and most daggers after [Vajsov 1993](#); author's own montage).

The early Copper Age

The early Copper Age has a domestic emphasis and is characterized by a fragmented cultural background with different and relatively isolated, regional societies of sedentary farming villagers, living in nucleated settlements. Framed by the Suvorovo-Novodanilovka herders in the north-east ([Govedarica 2004](#); [Anthony 2007](#)), branches of the Western Linearbandkeramik (LBK) and its successors in the west ([Whittle 1996](#)), and the emerging Trichterbecher (TRB) societies in the north-west ([Midgley 1992](#); [Klassen 2000, 2004](#)), the societies of the Kodžadermen-Gumelnița-Karanovo VI, Tripolye-Cucuteni, Salcuța-Krivodol-Bubanj Hum, and the Tiszapolgár-Bodrogresztur-Hunjadi Halom sequences are the most important of these (cf. [Parzinger 1993](#);

Whittle 1996; Bailey 2000; Chapman 2000). The typical copper inventory consists of primarily heavy hammer-axes and mattocks (e.g. Vulpe 1970; Novotná 1970; Todorova 1981; Patay 1984) and certain types of flat axes (Dobeš 1989; Schmitz 2004; Kienlin 2008), both known of in their thousands. The copper dagger is another object that appears in the record simultaneously in the western Pontic and the eastern Carpathian basin, but only from c. 4000 BC onwards (Vajsov 1993, 2002; Matuschik 1998). Additionally, copper and gold jewellery and personal adornments are well known, including bracelets, all kinds of rings, spirals, plates, and decorated pins. There is also a range of amulets and other symbolic items. Greece sees the first silver objects in its record, in the form of arm rings and amulet pendants (Zachos and Douzougli 1999; Maran 2000; also Turkey, cf. Zimmermann 2005).

The middle Copper Age

Ever-increasing interaction between herders and emerging pastoralists of the Pontic Steppe belt and their sedentary neighbours at the lower Danube and the eastern Carpathians in the first quarter of the fourth millennium BC (Anthony 2007; Meyer 2008) led to a new emphasis on stock. Subsequent changes in the economy required a different lifestyle and settlement organization. Consequently, this altered social foundations which affected ritual, spirituality, and cult, for example with paired cattle burials appearing in the record for the Baden and Globular Amphora cultures (Pollex 1999). These are perhaps the mechanisms behind the rapid expansion of these cultures as well as Cernavodă III and Boleráz. Strikingly, metal production, circulation, and deposition followed an opposite pathway to this cultural expansion in most of south-eastern and central Europe. This horizon sees the end of the heavy copper holed axes. Gold also disappears completely from the record, as most of the silver does in the Aegean. However, flat axes, particularly broader specimens like the Altheim and Vinča types continue (e.g. Dobeš 1989) and daggers flourish in some regions in the east, albeit as different forms from their predecessors (Vajsov 1993; Nikolova 1999). Jewellery continues as well, but as with all other metal artefacts in this horizon, seemingly in lower numbers. At a handful of Baden sites in Austria and Slovakia, the neck ring re-enters the record after a short appearance in the mid-fifth millennium.

The late Copper Age

The late Copper Age is signalled by the infiltration of populations associated with the Yamnaya culture from the northern Pontic steppe belt, into large parts of south-eastern Europe with similar environmental conditions from c. 3000 BC (Anthony 2007; Heyd 2011). This event was not perhaps as drastic as one might think, but it would have been part of a new quality of interaction and communication between essentially heterogeneous social groups. This trajectory was accompanied by a range of innovations in the social, technological, and economic spheres, including the now widespread use of horses and wheeled transport, as well as in other material culture. This package also included a distinct series of new metal categories and types (Harrison and Heyd 2007; Subbotin 2008). The copper inventory around the Balkans and Carpathians sees the re-appearance of the holed axe, now in the form of the single edged shaft-hole axes of the Fajsz, Baniabic, and Corbasca types, undoubtedly originating from the circum-Pontic and Caucasus regions (Kohl 2007, 57ff). Along with them comes the tanged dagger; a distinct form of awl with swollen middle shaft; and small hair or temple-rings made sometimes of gold, but mostly of silver and occasionally copper. Besides, flat axes continue throughout the third millennium—for example, in the form of the Griča and Baranda types of south-eastern and central Europe (Kuna 1981)—and at the same time the first flanged ones appear, foreshadowing early Bronze Age forms.

Whilst the various eastern and central European Corded Ware groups from the second quarter of the third millennium BC remain mostly metal-poor, later types of the single-edged shaft-hole axes flourish in south-eastern Europe and the Carpathian basin. It is only then, in the context of the expansion of the Bell Beaker phenomenon during the mid-millennium, that tanged copper daggers and small awls reach a prominence and range never experienced before (Heyd 2007), with rare daggers in gold and silver showing they have risen once more in social significance. Generally, regions now seem more closely linked, and gold and to a lesser extent silver reappear as jewellery and for symbolic or prestigious objects. The silver hair-rings of the aforementioned Yamnaya package transform rapidly into Corded Ware precious metal hair-rings and copper hair-spirals. Subsequently, two trajectories appear: a central European Bell Beaker branch consisting of hair-rings of the distinct Sion type dated to c. 2500–2400 BC, and the *Noppenringe* and British Bell Beaker branch of golden basket earrings, or more likely hair-rings.

INCONSISTENCIES IN CHRONOLOGIES, DISTRIBUTIONS,

AND CONTEXTS

Despite these clearly visible evolutionary trends in early European metalwork, there are some aspects of the metallurgy that are still in dispute or not quite understood.

The first is the apparent sudden appearance of the heavy Pločnik-type hammer axes, said to be the earliest cast axes in Europe, around the mid-fifth millennium BC. They stand at the beginning of a long series of heavy axes and then mattocks, both dominating the record of the early Copper Age in their thousands. They are found over a vast area from the western Ukraine to Slovakia/Slovenia ([Govedarica 2001](#); [Radivojević 2006](#)). Most of them enter the record as single finds, which links them to all the other later heavy axes. But several come from the fifth millennium BC hoard of Karbuna in the Ukraine, the Pločnik hoards in eastern Serbia, the Tiszapolgár cemetery of Tibava in eastern Slovakia, and Varna grave 43 in Bulgaria. Varna has new AMS ^{14}C -dates which centre around 4500 BC ([Higham et al. 2007](#)), matching the Tripolye A2 pot in which the hoard of Karbuna was deposited, whilst Tibava grave C is later by perhaps one or two centuries. However, the four Pločnik hoards, consisting of 45 objects altogether, are dug into an earlier Vinča layer ([Stalio 1964](#)), giving them a probable date within the second quarter of the fifth millennium BC. It is therefore quite possible that a European pyrotechnical metallurgy which produced these heavy axes originated from the central Balkans and the Vinča culture, supporting the new Belovode evidence mentioned above. This would make it the heartland not only of an independent European metallurgy, but also of a millennium-long early Copper Age axe tradition.

In the later stages of the fifth millennium BC heavy hammer-axes and mattocks are found largely in the western and north-western Pontic, eastern Balkans, and eastern Carpathian basin. Between 4100 and 3800 BC, it is the Carpathian basin as a whole, and particularly its western and north-western regions, which produce the most, whilst their numbers across the previous centre to the east are declining ([Meyer 2008](#); [Ivanova 2008](#)). This is why the Hungarian tradition calls this period the 'High Copper Age'. It is also in the three centuries around 4000 BC that metallurgy is exported westward, for example, the Şiria type axe from Überlingen at Lake Constance ([Matuschik and Matschullat 1997](#)), perhaps the flat axe from Pont-de-Roide in eastern France ([Klassen et al. 2007](#)), and the famous gold lozenge from Pauilhac in Aquitaine ([Roussot-Larroque 2008](#)). Axes of Carpathian manufacture are also reaching the northern European plain ([Müller 2001](#); [Łęczycki 2005](#)) and southern Scandinavia ([Klassen 2000](#)), and there is a contemporaneous spread south-west with the first copper

artefacts entering the southern Alps and the Padanian plain of northern Italy (Zimmermann 2007; Gleirscher 2008). The next stage, from c. 3700 BC into the second half of the fourth millennium BC, sees the metal supply of the Carpathian basin vanishing and the previously described zones to the west, north-west, and south-west becoming the new centres of a central European metallurgy. Thus, a north Alpine metallurgical zone develops (Matuschik 1998; Bartelheim et al. 2002; Bartelheim 2007; Roberts and Frieman, this volume); a distinct hoarding tradition emerges in TRB Poland (Łeczycki 2004); and the distribution of flat axes in southern Scandinavia reaches its peak (Klassen 2000). This is also the period when independent metallurgy emerges in the central and western Mediterranean (Bartelheim and Pearce, this volume). There can be little doubt these developments are interlinked, but as yet there is no convincing model explaining these large-scale geographical shifts. Many questions remain. Were unique historical events responsible? Was there a breakdown of networks, first in the east and then in the Carpathian basin? Alternatively, was there a general devaluation of metals or loss of symbolic value? Or, more simply, did the copper ores in the east become exhausted with no technology available to move to different sources?

Exactly the same questions have been asked of the so-called middle Copper Age metal decline across most of south-eastern Europe around the middle and second half of the fourth millennium BC. The scarcity of metal objects in the Cernavodă III-Boleráz cultures of the lower Danube and the Carpathian basin compared with previous periods has long been recognized (Roman and Diamandi 2001), as it has for the whole of the Baden sequence, and many contemporary societies in the lower Danube, the Balkans, and in Greece (Maran 1998, 513). Metals are also virtually absent during the early Helladic and Cycladic I of the late fourth and early third millennia BC in Greece, although termed here early Bronze Age (McGehean-Liritzis 1996; Rambach 2000), as they are in the whole of the Globular Amphora culture of the north (which preceded the central area later occupied by the Corded Ware). In contrast, contemporary metal objects are quite well known from the Coțofeni of Transylvania (Mareš 2002; Ciugudean 2002), the Usatovo and related late Tripolye societies in the north-western Pontic region (Anthony 2007; Kohl 2007, 28ff), and as already described, for north-Alpine central Europe. Overall, south-eastern and central Europe offer distinctly differing pictures in this period. Yet as a whole the heavy copper axes and mattocks of the early Copper Age, which were probably symbols of value, wealth, and power, have disappeared.

This goes along with fundamental changes of context. Hoarding was no longer practised and lavishly equipped graves were also now

absent. Instead, wealth and status were perhaps negotiated through other media such as the single, paired, or multiple cattle burials of the Baden and Globular Amphora cultures. Nonetheless, even in what are regarded as metal-free regions, Cernavodă III-Boleráz and Baden-period metalwork exists, albeit mostly in low numbers and as smaller objects (e.g. knives, chisels, awls, jewellery and other miscellaneous objects). The conclusion is that the decline may not be as sharp as commonly suggested. A depression in metal circulation is being dealt with, which was geographically quite varied; less metal may have been available in the Carpathian basin, but elsewhere there may be continuity.

BEYOND VARNA AND GOLD: THE SOCIAL IMPLICATIONS

There seem to be two major opinions when it comes to the social implications of early metalwork: the most popular describes metallurgy as one of the key triggers for emerging social, economic, and ritual complexity, particular during the early Copper Age horizon (e.g. [Renfrew 1978](#); contributions of J. Lichardus in [Lichardus 1991a](#); [Sherratt 1994](#)); the other sees its impact as rather marginal (e.g. [Parkinson 2006](#); [Kienlin 2008](#)) and of little importance in terms of social stratification. This latter has been proposed especially for the Carpathian basin and is supported by the absence of settlement evidence for advanced social hierarchy in Bulgaria and Romania. It does, however, have to acknowledge the special position of the famous Chalcolithic cemetery of Varna in Bulgaria ([Slavchev 2008](#)), which has produced over 3,000 single gold objects, weighing more than 6kg; 165 copper objects, many of them larger axes and adzes ([Higham et al. 2008](#), 95); more than 230 flint artefacts and around 90 stone objects; 650 clay products; and over 12,000 dentalium shells and around 1,100 *Spondylus* shell ornaments probably imported from the Aegean. Copper and gold obviously played an important role in the display of wealth, power, and perhaps status, a relationship clearly demonstrated by some clay vessels from prominent graves being decorated in gold powder, the multiple axe offerings in graves 1, 4, and 97, or, most lavishly, by the so-called ‘chieftain’s’ grave 43 ([Todorova 1981](#); [Fol and Lichardus 1988](#)). The man buried in the latter has been described as having a symbolic role in, or control over, metalworking due to his special metal tool collection (as has cenotaph grave 4), and the grave’s so-called golden penis sheath could well be a golden replica of a tuyère (jet-like air-concentrator normally made of backed clay).

Did the Varna cemetery and its accumulation of wealth really stand

alone in south-eastern Europe? Interestingly, the answer must be both ‘yes’ and ‘no’. Yes, because as a funerary ensemble and a cemetery nothing can match it currently and perhaps never will. No, because there are structurally similar accumulations of material wealth, and in particular metals, in the early Copper Age horizon from a wide geographical range—however, they are mostly from hoards (Fig. 35.2). Massive golden bracelets like those from Varna (graves 1, 4, 36, 43, and 97), each weighing more than 100g, are known from Fundeni-Lungoci (probably a grave, or part of a hoard) and Balaci (a single find or part of a hoard) in the Romanian Lower Danube (Govedarica 2004), from the Moigrád hoard in Transylvania, and in the form of an arm spiral weighing 165.9g from the Tiszaszölös hoard in the Hungarian plain (Makkay 1989). The Moigrád and Tiszaszölös treasures themselves, with their lozenges, plates, and other things, must each have originally contained more than a kilo of pure gold, with the oval plate or pendant of Moigrád, with a diameter of an incredible 31.1cm, totalling 780g alone. But there is more: one can add the hoard from house 4 of the Chotnica site in Bulgaria with its 44 pieces of golden jewellery and pendants weighs 310g altogether (Todorova and Vajsov 2001); the Hencida hoard in Hungary weighs c. 150g (the largest pendant 94.91g; Virág 2003); the two gold disks from Stollhof in Austria weigh 121g and 71g; the two gold disks from Tenja-Orlovinja in Croatia weigh 150g (and more than double if one can add the gold bands and rings, Glogović 2003); the two Csáford disks weigh 140g (Korek 1960); the Ercsi hoard pieces are of similar weight (‘Trésors... 2001’); there is the 21.4cm wide Štramberg-Kotouč silver disk (Hásek 1989); and the collection of golden pendants most likely from another hoard said to have originated in either Greece or Bulgaria (Dimakopoulou 1998). Similarly, there are the big copper axe hoards, such as Plakuder in Bulgaria and Bečmen in Serbia each containing more than five kilos of pure copper (Lichardus-Itten 1991), the four Pločnik hoards weighing a total of 16kg, or the full metal hilted and decorated Jászladány axe from Osijek in Croatia (Jovanović 1979, 40–41, pl. II, 1–3) made of 18kg of pure copper, the heaviest single copper artefact for millennia (Fig. 35.3). Even the clay vessels with their decoration in gold powder have now found a parallel from the slightly later Bubanj site of Niš-Novo Selo in eastern Serbia (Stojić and Jocić 2006, 257, fig. 41). Lavishly equipped graves have also come to light, if only in limited numbers. Apart from the enigmatic Fundeni, there is now Giurgiulesti in Moldova (Govedarica 2004) and some other sites in the Ukraine (Rassamakin 2004) which belong to the Ochre Graves of the Suvorovo-Novodanilovka group (Anthony 2007, 249–258). As argued for Varna (Lichardus 1991b; Lichardus and Lichardus-Itten 2003), it was perhaps the north-eastern connection to

the steppes which brought the idea of lavish grave furniture (Fig. 35.4), and the display of wealth, prestige, power, and social position in the grave, to the early Copper Age sedentary farming communities of south-eastern Europe.

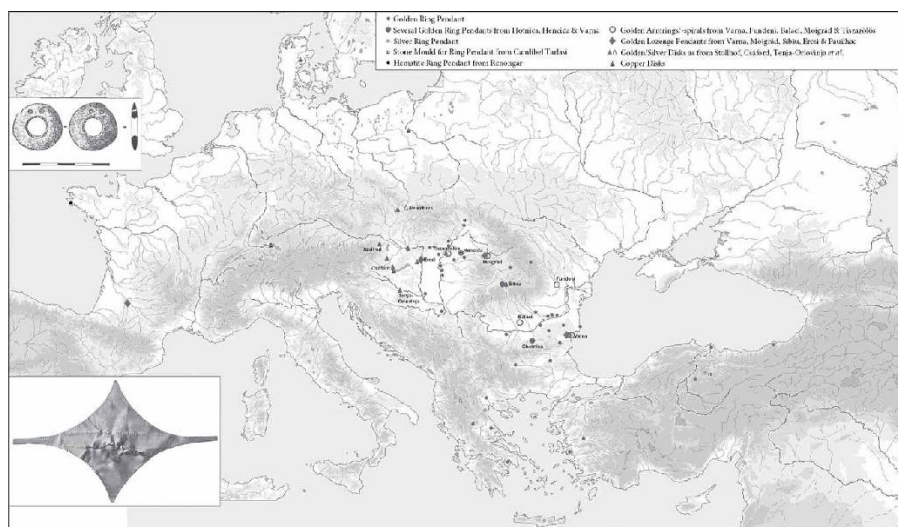


FIG. 35.2. Distribution map of early Copper Age golden bracelets, disks/lozenges, and gold/silver pendants.

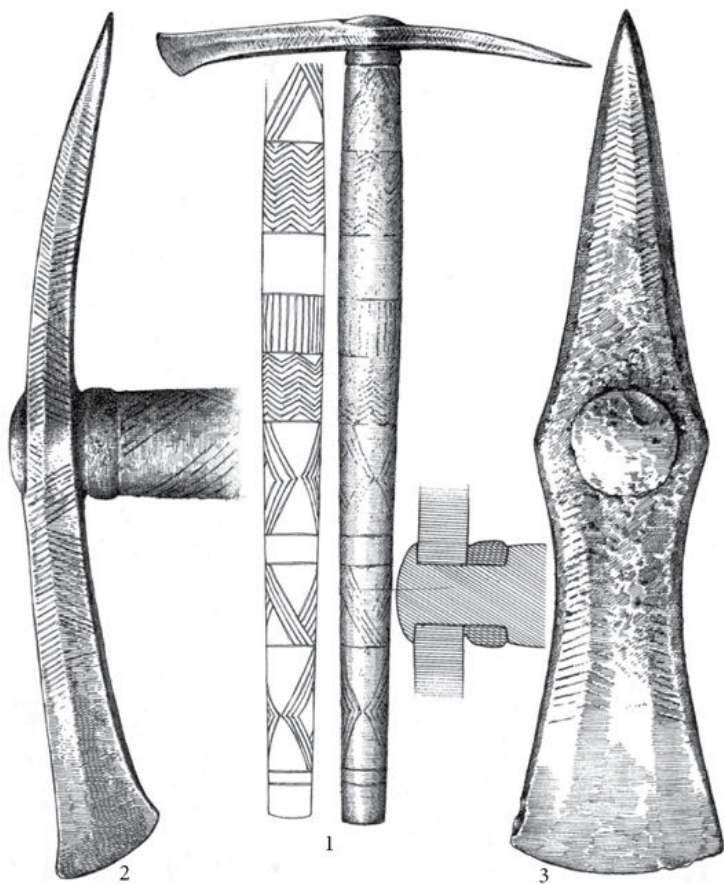


FIG. 35.3. Copper axe from Osijek, Croatia (after [Jovanović 1979](#)).

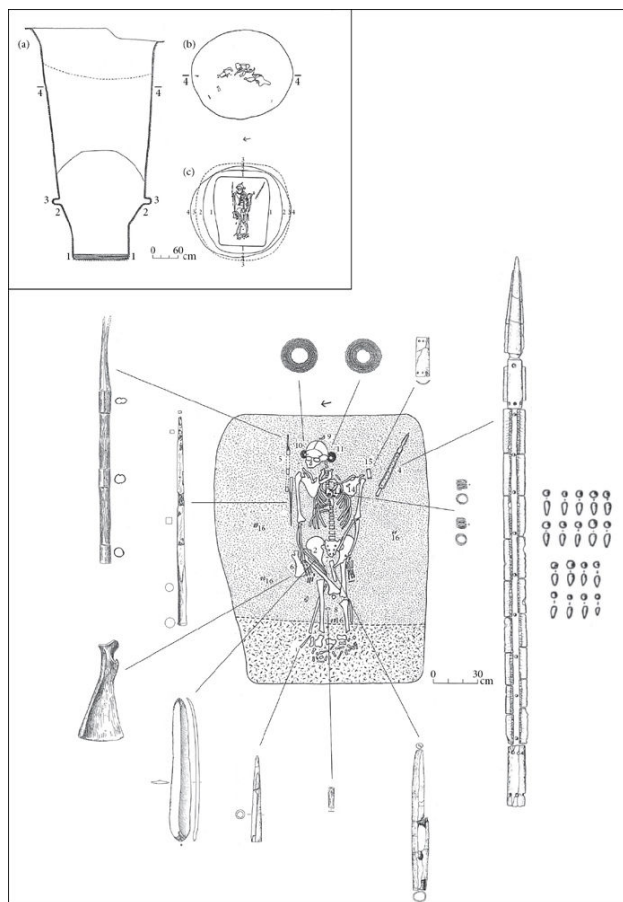


FIG. 35.4. Giurgiulesti, Moldova, grave 4: plans, section, and funerary equipment

(after [Govedarica 2004](#)).

A key theme is the relationship between graves, hoards, and single deposits ([Lichardus-Itten 1991](#), 757–758), especially since the same metal categories, like the copper axes, golden lozenges, plates, and pendants, came from all three. Indeed, the so-called ‘cenotaphs’ from Varna and other cemeteries in the west-Pontic region are effectively hoards in a funerary context (see [Chapman 2000](#)). It must be mentioned that there is an independent structural similarity with other regions and periods: valuable object deposition in graves and hoards is known from the Nordic and Atlantic Bronze Age, Urnfield central Europe, and the Carpathian basin in the late Bronze Age, indicating a deep-seated correlation between burial and hoarding which is cross-cultural and supra-regional. One can infer that the Varna cemetery and its contemporary hoards are just one among many similar patterns in later European prehistory.

Whilst metal objects had a fluctuating value, it was essential that the rarity of the material and the skills needed to produce it were not available readily. Through limiting people's ability to access and produce metals themselves, and the events during which it was produced and used, and by controlling the amount available by conspicuously removing some of it from circulation, elites were able to maintain the management of it. It was crucial that metal retained its performative quality, such as the significance of its use in funerary customs, for social power and control to be maintained. The graves and hoards therefore demonstrate sharp inequality over wide parts of Europe in the fifth and early fourth millennia BC which can be best explained in terms of social stratification. Evidence from fifth-millennium BC settlements can be added for many parts of south-eastern Europe, with new functional ideas on tell sites and their surrounding outer settlements and perhaps satellite flat sites opening up new perspectives (e.g. Pietrele: [Hansen et al. 2007](#)), with proven inequalities within settlements in the form of house sizes (e.g. Durankulak: [Todorova 2002](#)), two-storey houses ([Nikolov 2004](#)), and evidence for pottery inventories of larger houses differing from their neighbours in both quality and quantity (e.g. Drama: [Lichardus et al. 2003](#)).

This pattern of robust social institutions and enhanced complexity, of lineages and powerful individuals, of networks and bonds, remains persistent in time and space, albeit fluctuating in intensity. Social and economic peaks, such as at Varna and the human groups and individuals behind the described hoards, or the 'mega-villages' of the middle and late Tripolye in the Ukraine ([Kruts et al. 2001](#); [Kohl 2007](#)), exist for centuries and then vanish. However, we also see depressions in that picture, such as with the aforementioned geographical shift in metallurgical activity from east to west. Another example are the centuries during the middle Copper Age when institutions, networks, and international exchange are partly interrupted, and a system of symbols and values other than metals and exotic objects finds its expression. Lavish graves and hoards disappear, but there can be no doubt that social complexity continues on some level, even if archaeologically it is more difficult to understand. The tide turns again in the late Copper Age, at least regionally, when princely graves like Velika and Mala Gruda or Podgoritsa-Tološi, all in Montenegro, and strongly hierarchic settlements like Vučedol in Serbia, appear in the first quarter of the third millennium BC ([Harrison and Heyd 2007](#)), foreshadowing Bronze Age consistency. The European Copper Age was not a stable world, and this system of inherent instability is one of its characteristics, beside the megaliths, recurrent steppe infiltrations, and the ideologies, to name but the

more prominent.

As for the societal impact of early metallurgy, there can be no doubt that any exploitation of ores—particularly in the early copper mines of Aibunar and Medni Rid (Burgas) in Bulgaria, and Rudna Glava and Majdanpek in Serbia—along with ore preparations, the reduction process, and then casting, occurs at a scale in excess of the self-sufficient hamlet or village. It requires the division of labour, specialization, and the year-round availability of skilled individuals. The marketing and exchange of finished products beyond the local scale demands even more specialists, likely absent from their kin for long periods, and creates new or enhanced networks and communication routes. The restricted availability of metals, their resultant social prestige, and their cumulative value as a contributor to and indicator of wealth would all have created and enhanced their significance.

Whilst this is true, closed statements about the role of metals solely creating a vertical social stratification are now recognized as outmoded and simplistic, and what can also be seen is horizontal differentiation. The origin of metal production and use is not the only trigger of a new Copper Age epoch with a differentiated social system, although it is one of the more important dimensions. Margareta Primas's statement about the Bronze Age (1996) can be applied earlier—metals were the grease which kept the Copper Age motor running.

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CHAPTER 36

EARLY METALLURGY IN IBERIA AND THE WESTERN MEDITERRANEAN

MARTIN BARTELHEIM AND MARK PEARCE

It is very difficult to imagine the effect copper had on the Neolithic world. One major impact will have been visual ([Pearce 2007](#)). Later, Homeric poetry describes the ‘shining’ or ‘flashing’ armour of the Greek and Trojan armies; in a world without metal, only water would have caught the light in the same way. This quality may have meant that early metal objects functioned much as ‘bling’ does in the modern world, as a marker of wealth or identity. The technological qualities of metal were also revolutionary: metal artefacts can be repaired without the loss of raw material (unlike stone tools) or recycled to make new objects, and metal can be formed into complex shapes by casting or working. Finally, copper, silver, and gold are relatively scarce, and are not distributed uniformly across the landscape; thus metal use, or the possession of metal resources, may possibly be a measure of wealth. It might therefore be maintained that metalwork is an important index for the emergence of social complexity.

THE IBERIAN PENINSULA

The Iberian peninsula is potentially important for early metallurgy due to its almost ubiquitous wealth in ores ([Bartelheim 2007](#), fig. II.7). However, our knowledge differs significantly from region to region. The southern half of the peninsula, and especially the Spanish region of Andalusia, is best known.

The Chalcolithic

The metal-using phase of the Iberian Neolithic is usually named ‘Chalcolithic’ and represents the final Stone Age and transition to the Bronze Age. Nevertheless, its development and exact absolute chronology are still much debated. At the beginning of the twentieth

century a division was made between a Bell Beaker and a pre-Bell Beaker phase on the basis of finds from the southern Spanish settlement and cemetery of Los Millares ([Molina and Cámara 2006](#), 26–30). Settlement stratigraphies at Vila Nova de São Pedro and Zambujal (Portugal) and the Cerro de la Virgen (Andalusia) ([Schüle 1980](#); [Sangmeister and Schubart 1981](#)) made it possible to refine the chronology into an early, full, and final Chalcolithic ([Martín et al. 2000](#)). The full Chalcolithic is represented by the Los Millares culture (or Los Millares I culture) and the late Chalcolithic by the appearance of Bell Beakers (Los Millares II). In terms of absolute chronology it can only be stated that the entire Los Millares culture covered the period from c. 3000 until c. 2300 BC ([Castro et al. 1996](#), 79–82).

Settlements are characterized by many small and a few large complex sites. The large settlements cover several hectares and like some of the smaller sites (e.g. Almizaraque, Terrera Ventura, El Malagón, Cerro de la Virgen) ([Nocete 2001](#)) are surrounded by defensive works.

Burials are usually collective in megalithic tombs ([Leisner 1943](#)) and in caves. Individual burials appear from the mid third millennium, but remain a minority until the Bronze Age, making it difficult to identify the social rank of individual persons. Nevertheless, in view of the limited number of Chalcolithic graves and monumentalism of megalithic tombs, it is not unlikely that those buried there were members of an elite ([Lacalle 2000](#)). The existence of large fortified settlements also suggests a socially dominant group even if this is not reflected in what we currently know about their organization. On the basis of size it seems very likely that the large settlements functioned as central places for the surrounding area. Their complex fortifications support this. Unfortunately, extensive excavations have not been carried out inside the settlements, nor have the catchment areas been investigated sufficiently to verify this assumption.

Early metallurgy

The earliest treatment of copper ores was found by excavations at the Neolithic settlement of Cerro Virtud in Andalusia. The excavators reported a pottery sherd with copper slag adhering to it in a secure middle Neolithic stratigraphic context. It points towards the use of local carbonate copper ores. The corresponding archaeological layer (in which no metal objects were found) has been radiocarbon dated to around 4910–4460 BC ([Montero and Ruiz 1996](#)). The sherd is totally isolated in the regional chronology, with the next evidence for metallurgical activities dating to the third millennium BC. It is

therefore impossible to say if it indicates the independent discovery of metallurgy on the Iberian peninsula (Rovira 2002, 85).

Metal objects have only been found in significant numbers one and a half millennia later in the graves of the full Chalcolithic—after an ill-defined late Neolithic/early Chalcolithic with almost no metalwork. Most of these finds come from Andalusia (Fig. 36.1, Chalcolithic metal types in Andalusia), with the fortified settlement at Los Millares being the most prominent site. In this period arsenical copper was the main material produced from copper ores that also contain arsenic. Ores of this kind are abundant and easily accessible in the south of the Iberian peninsula (Gómez Ramos 1999; Montero 2004). There is no evidence for working tin bronze in the Iberian Chalcolithic.

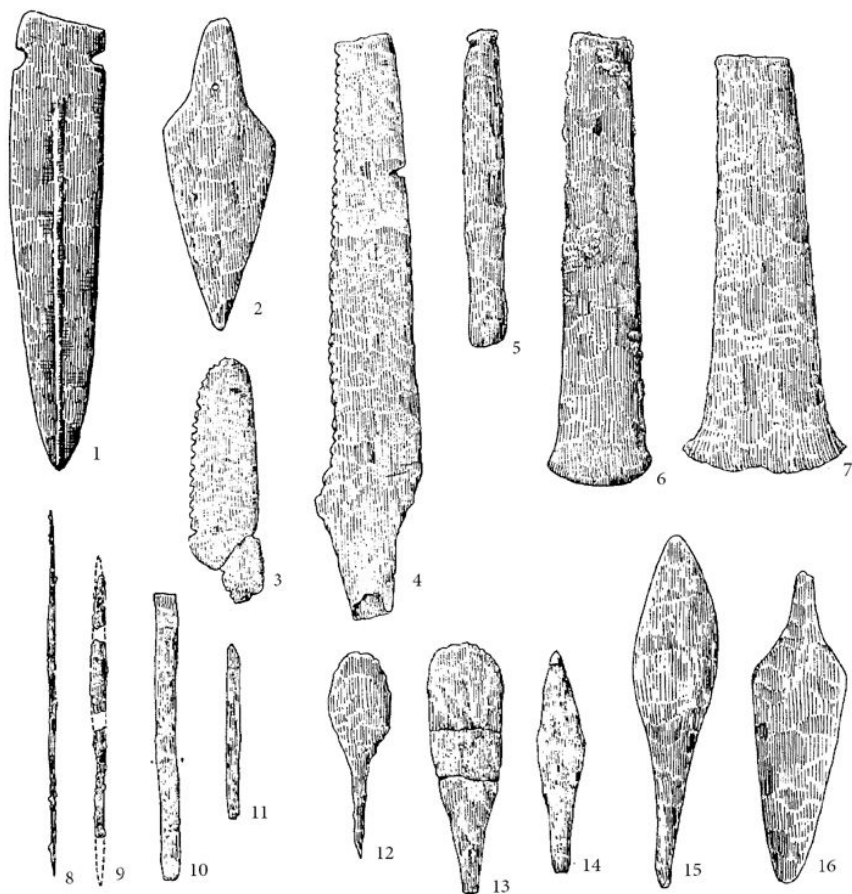


FIG. 36.1. Chalcolithic metal types (in Andalusia). 1,3-4,6,8-9 Los Millares; 2 Gádor, Loma de Huéchar; 7 Gádor, Loma de la Rambla de Huéchar; 10-11, 13-14 Almizaraque; 12 Fonelas; 15-16 Mojácar, Loma de Belmonte (after Leisner 1943 and Bartelheim 2007).

Indications for metallurgical activities are almost entirely restricted

to the portable remains of copper production: pieces of ore, mortars, grinding stones, hammerstones, slags, and fragments of slag-encrusted crucibles that were used to smelt ores. Important finds were only made in settlements, mainly in the south of the peninsula (Los Millares, Almizaraque, La Pijotilla, Cabezo Juré, Valencina de la Concepción) (Gómez Ramos 1999, Montero and Rovira 2013) and in the west (Zambujal, Leceia, Vila Nova de São Pedro) (Gómez Ramos 1999, 54–55; Müller and Soares 2008). No fixed smelting furnaces are currently known before the beginning of the Iron Age (Gómez Ramos 1999, 45–77, 181–186). The smelting of copper ores took place in mobile crucibles which were often placed in simple pit furnaces (Rovira 2002; Müller et al. 2004) like those recently excavated at Valencina de la Concepción near Seville (Nocete et al. 2008, Costa Caramé et al. 2010). However, residues of metal working—crucibles, casting waste, moulds, and semi-products—are found fairly frequently at settlements.

Chalcolithic copper mines were unknown on the Iberian peninsula until recent discoveries at Mocissos and Angerinha (southern Portugal). Here traces of copper mining were radiocarbon dated to the third millennium BC (Goldenberg and Hanning, in press). Oxide ores were exploited (mostly malachite and azurite with high arsenical content), fragments of which are frequently found at Chalcolithic settlements on the Iberian peninsula.

Socioeconomic context of early metallurgy

Only a few sites have been investigated to an extent that allows substantiated statements about the scale and importance of metallurgy. Nevertheless, the distribution of metallurgical residues over almost all the Iberian peninsula shows there was hardly anywhere that metal had to be imported from afar. This is also true for raw materials—in the Chalcolithic mostly copper, but also gold—as the distribution map of ore resources reveals (Bartelheim 2007, fig. II.7). On those sites investigated sufficiently to make statements about the scale of metallurgical activities—Almizaraque (Montero 1994, 114–115) and Los Millares (Hook et al. 1987; Montero 1994, 143–146)—it becomes obvious that metallurgy could not have been the economic basis of the settlements. Residues were only found in small quantities with production just serving local needs.

A survey of the available studies of early metallurgy on the Iberian peninsula reveals that in contrast to an often fairly good knowledge of several stages of Chalcolithic metal production in some areas—e.g. in Andalusia, in the northern Meseta, or in the Comunidad Valenciana (Delibes et al. 1999; Simón 1999)—it is not yet possible to reconstruct

the entire chaîne opératoire of metals including their distribution and organization.

Among the finds of the Iberian Chalcolithic metal plays a minor role. On most sites metal objects were found in small numbers. They are made mainly of pure copper, but a significant number contain 1–10% arsenic (Rovira et al. 1998, figs 3, 4). Gold is very rare. The range of object types is limited and consists of axes, daggers, awls, knives, saws, and projectile heads (Bartelheim 2007, fig. II.19). Ornaments are hardly known. Presumably, most weapons and tools were made of stone or organic materials.

The use of metal objects as status symbols can hardly be estimated given that we do not know the original quantity of metals. If it is assumed that megalithic tombs were burial places of high-ranking groups, and metal objects were valuable in the early days of metallurgy, then it seems quite likely that persons of high status were marked by depositing metal in their graves (Kunst 2013; cf. Robb, this volume). It remains, however, unclear whether differences in quantity and kind of metal objects can provide information about social differences (Bartelheim 2007, 58–60, 265). Other objects whose acquisition was difficult, either because the raw materials had to be imported—like ivory (Schuhmacher et al. 2009; Schuhmacher 2013), marble, variscite, tuffite, or several kinds of flint—or due to a sophisticated production technique—like long flint blades, and the heavily decorated stone vessels or idols—probably also functioned as status symbols. They are usually found in graves together with metal objects.

In view of the narrow range of types and the fairly low number of pieces in Chalcolithic contexts, it seems likely that metallurgy was not the driving force of technological and social change and lacked an important economic function (cf. Chapman 1990). Settlements concentrate in regions with good agricultural conditions, suggesting that the power of the elites was economically based on agriculture (cf. also Nocete 2001, 45).

THE ITALIAN PENINSULA

Earliest metallurgy c. 4500–3500 BC

The earliest use of copper artefacts in Italy seems to date to around the mid-fifth millennium BC. The evidence is uncertain, as contexts are not reliable, but a number of copper axes are known (Pearce 2007, 38–42); they are all relatively small in size and seem to be

skeuomorphs of polished stone axes. It is noteworthy that this earliest evidence is mostly from the Po valley, in the north of Italy, far from the Aegean which has traditionally been considered the origin of Italian metallurgy (e.g. [Cazzella 1994](#)). Similar axes found in central Italy seem to have been cast in two-piece moulds ([Giardino 2013](#), 19–20) and are therefore probably later in date.

The working of metal in Italy also first appears in the north, at the Chassey-Lagozza culture site of Bottegghino near Parma where copper smelting is demonstrated by smelting slag and a crucible fragment, and has been radiocarbon dated to about 4300 BC ([Mazzieri and Dal Santo 2007](#)). Two copper awls were also found. This early date is paralleled by evidence from Brixlegg, in the Inn valley of Austria, where the smelting of fahlore is attested at 3960–3650 BC, and possibly even earlier as radiocarbon determinations for the Münchshöfener culture level in which the metalworking was found range from 4500 to 4160 BC ([Höppner et al. 2005](#)). Interestingly, cultural relations with Italy are attested by the finding at Brixlegg of pottery of Italian origin (datable to c. 4200 BC) and southern Alpine flint ([Huijsmans and Krauß 1998](#), Abb. 305, 306).

It is in the late fifth and early part of the fourth millennium that copper use and working begins to become widespread in Italy. Most of the artefacts documented in this period are copper awls or points (though axes are also found), and similar artefacts are known in the early metallurgy of the Balkans, Aegean, Austria, Switzerland, and southern Germany ([Pearce 2007](#), 46–47). They are likely to have been used as pressure-flaking tools for the manufacture of bifacial flint implements, which become common in this period, though they may also have been used for tattooing, leatherworking, and basket-making ([Pearce 2007](#), 48–50). It is often argued that early copper must have been very scarce, and therefore carefully conserved because of its value. However, the early awls in Italy are all casual losses (or discards) at settlement sites; it seems odd that they were not recovered and recycled and/or repaired. The implication is that their owners could afford to lose them and thus that copper artefacts were relatively easy to obtain or perceived as having little value. Consequently, we might argue there was much more copper in circulation than is documented by finds to date. An alternative hypothesis must also be considered: that once broken, awls could not be repaired as the local communities using them lacked the necessary know-how, and so they were discarded ([Pearce 2007](#), 48–51, Table 3.8).

Copper axes of type Bocca Lorenza (or Gurnitz) are found in north-eastern Italy and may be dated to 4000–3800 BC on typological and metallurgical grounds ([Klassen 2010](#)) and on the basis of the

stratigraphy of the Bocca Lorenza cave, where three were found (Pearce 2007, 42–46). As well as in north-east Italy, they are found in the Slovene Karst, the eastern Alps, the middle Danube, and the Carpathian basin (Klassen 2010).

Copper working is attested in central Italy in the early fourth millennium: in Tuscany, at Neto-Via Verga (Volante 2003, 378), close to a copper ore outcrop, there is a crucible, slag, a possible metalworking hearth and an awl, datable to 3710–3370 BC; in the Marche, there is copper slag at Santa Maria in Selva (Silvestrini et al. 2002, 458). In the south of Italy, slag was found on the acropolis, Lipari island (off Sicily), and is dated 4315–3570 BC (Bernabò Brea and Cavalier 1980, 337, 339, 490).

Perhaps the most significant evidence is for early fourth millennium BC copper mining, the oldest attested so far in western Europe (Maggi and Pearce 2005). In Liguria, north-west Italy, mining at Libiola dates to 3490–3120 BC, whilst dates from young-wood charcoal from the excavations at Monte Loreto document copper mining from around 3500 BC. Rescue excavations at Monte Loreto suggest mining may have begun even earlier, with a radiocarbon date of 3940–3700 BC (Campana et al. 2006, Table I). At Grotta della Monaca, Calabria, in the very south of Italy, malachite mining for pigments is attested in the fourth millennium BC (Larocca 2010). At Monte Loreto copper ore was mined in deep trenches, pits, and vertical shafts by fire-setting (heating the rock to shatter it) and using grooved hammerstones. The extracted rock was then broken up with hammerstones and sorted to separate out the ore. Techniques at the nearby Libiola mine are likely to have been similar: here wooden wedges, a shovel, an oak pick-handle, and stone hammers were found in a narrow artificial gallery. Hammerstones are also known from Grotta della Monaca, where they were used to break up stalagmites, stalactites, and calcite flows in the cave—malachite was also scraped from the cave walls. Hammerstones have been found at other sites in Calabria, suggesting there may be other undiscovered prehistoric mines in that mineral-rich region (Marino 2010).

The Chalcolithic c. 3500–2500 BC

Although the concept of a Chalcolithic (or ‘Copper Age’, or ‘Eneolithic’) is controversial in some parts of Europe, it is probably appropriate for the Italian evidence, where technological changes seem to be paralleled by social and cultural changes. The second half of the fourth millennium BC sees the development of four metallurgical areas: the Remedello culture of the Po plain, Rinaldone in Tuscany and Lazio, Gaudio in Campania, and Ozieri and Sub-Ozieri

in Sardinia.

The metalwork of the Remedello, Rinaldone, and Gaudio cultures consists primarily of daggers, halberds, and flat axes. It has been shown that whilst the flat axes are made of relatively pure copper, with less than 1% arsenic, the daggers and halberds have a higher arsenic content (De Marinis 1992); a similar pattern is found in the early copper-using Altheim, Pfyn, Cortaillod, and Mondsee groups of the circumalpine area (Ottaway 1982, 136–138, Table 12). Whether these differences reflect deliberate alloying or selection of different ores, it is likely that prehistoric metalworkers and those who used these artefacts were aware of the mechanical differences between the (copper) axes and the (arsenical copper) daggers and halberds; they would certainly have noticed differences in colour between the alloys (Pearce 2007, 84–86). Arsenical copper has many advantages: its casting properties are superior to those of pure copper and it can be work-hardened to strengths equivalent to tin bronze (Lechtman 1996).

The Remedello culture is best known from individual burials in simple trench graves, and in particular from the cemetery at Remedello in Lombardy. Males are usually buried with daggers and arrows, with copper grave goods of daggers, axes, awls, and ornaments (Fig. 36.2); some silver ornaments are also known. The alluvial Po plain has no copper outcrops, but ores may be found in the Alps and Apennines to the north, west, and south (Pearce 2007, 53–62); indeed contemporary copper smelting is documented at a number of sites in the Trento basin (e.g. Acquaviva, Riparo Gaban, Romagnano Loch) by slag, crucibles, tuyères, and furnaces (Pearce 2007, 74–76). The chalcopyrite ores smelted came from the surrounding alpine valleys. The evidence from Acquaviva and Romagnano Loch shows a clear association between the use of rock shelters for metalworking and burial (Nicolis 2001, 36); the explanation for this association may lie in the magical nature of smelting, where powdered rock is transformed into liquid metal. There may have been quite large amounts of copper in circulation in Chalcolithic northern Italy: estimates for production at the Libiola and Monte Loreto mines, the latter of which was active into the mid third millennium BC, suggest a total production of about 748 tons of copper, or 515kg per year (Campana et al. 2006).

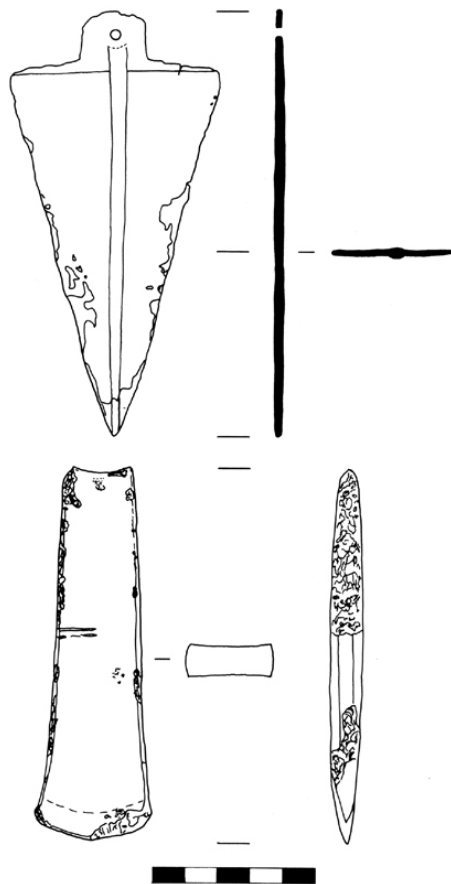


FIG. 36.2. A Remedello type dagger and axe, Sabbione (Pearce 1991, Tav.V.17 and Tav.VI. 19).

Statue-stelae, menhirs, and rock carvings from the mountains around the Po plain (outside the area of the Remedello culture) carry representations of what appear to be Copper Age metal artefacts, and indeed these are used to date them (Barfield 1998). Statue-stelae are found in five discrete groups—the Lunigiana, Aosta, the Valtellina, Valcamonica, and the Trentino Alto-Adige—and they appear to represent male and female ancestors. The symbol of the adult male appears to be the weapon, and males are depicted as warriors, armed to the teeth with daggers, halberds, and axes (Fig. 36.3). Some of the stelae themselves even have the shape of daggers (Bagolini 1981, 256). Copper weapons are also depicted in the rock engravings of the Valcamonica and Valtellina, and at Mont Bègo in the French Alpes-Maritimes (Barfield and Chippindale 1997). It is noteworthy that Remedello type triangular daggers, widely depicted in this art, do not seem to occur in the areas where the art is made (Nicolis 2001, 365, note 83). Halberds are generally held to have had ceremonial

significance and to have been a status symbol, not least because of their depiction on statue-stelae, menhirs, and in rock art. [Barfield \(1969\)](#) suggests they originated in the Rinaldone culture of central Italy.



FIG. 36.3. Statue stela n.1, Arco

(copyright Ufficio Beni Archeologici, Provincia Autonoma di Trento).

Perhaps the best known Copper Age artefact is the copper axe found with the Iceman ('Ötzi') near the high Hauslabjoch pass between Italy and Austria, and dated to about 3200 BC. This axe, which shows close parallels to one found in tomb 102 at Remedello ([De Marinis 1992](#), 392–394), raises a number of questions about the role of metalwork in Copper Age society. In contrast with depictions of axes on statue-stelae or in rock-art, where dagger and axe blades are very visible, the axe is hafted in such a way that much of it is hidden—just 2.6cm of

the 9.3cm long blade would have been visible ([Barfield 1994](#), 20, fig. 3). This weakens the argument that such weapons were display objects, status symbols, and we might prefer to interpret the Iceman's axe as a normal item of kit (just as his other equipment seems to be ideal for trekking at high altitudes). If it was indeed normal for a man travelling at an altitude of over 3,000m in the southern Alps to carry a copper axe, then this suggests that copper artefacts may have been much more common than appears from Copper Age contexts ([Pearce 2007](#), 51–52). This supports the suggestion that large amounts of metal were mined at Libiola and Monte Loreto in the fourth and third millennia BC.

The Rinaldone culture is also best known from burials, in trench graves, caves, and rock-cut tombs, and these are concentrated in two main areas: in the Fiora valley and around the Colline Metallifere, both concentrations correlating with the presence of metal ores ([Barker 1981](#), 75, 86, fig. 24; [Giardino 2013](#)). Both individual and multiple burials are known, and metal finds consist of copper daggers, halberds, axes, awls, and ornaments. Antimony and silver ornaments are also documented. Rinaldone metalwork has higher percentages of antimony than Remedello or Gaudio artefacts, perhaps indicating the exploitation of local ores from the Colline Metallifere ([Barker 1981](#), 86–88). Lead isotope analysis of a halberd and a dagger from San Cristoforo delle Vertighe seems to confirm the use of Tuscan ores for Rinaldone metalwork though the exact outcrop has not been identified ([Buresta et al. 2006](#)). Possible crucibles have been found at Poggialti Vallelunga, Garavicchio, and Ponte San Pietro ([Dolfini 2004](#), 215, note 61). Individual burials, generally males over 12 years of age, are equipped with flint arrowheads; some have a stone or copper weapon (axe, dagger, or battle-axe) for close quarters combat. Maleness again seems to be linked to a warrior (and/or huntsman) identity. Richer tombs have more weapons, two or three in copper, and occasionally also a halberd ([Dolfini 2004](#), 227–229).

Metal artefacts are rarer in the tombs of the Gaudio culture, consisting of daggers, blades, axes, pins, and awls. The burials, in rock cut tombs, are generally multiple, though high-status individual burials are known, such as the Tomb of the Chieftain at Mirabello Eclano, whose rich grave goods included three copper daggers and an axe ([Barker 1981](#), 71–75; [Bailo Modesti and Salerno 1998](#)).

At Millan/Milland in the Alto Adige/Südtirol, chalcopyrite ore was being smelted at 2870–2490 BC ([Dal Ri and Tecchiati 2005](#), 7, 19) and at Tanzgasse at 2580–2235 BC ([Dal Ri et al. 2004](#), 155–156, 158, Table XIV). Copper Age smelting is also known from two hilltop sites in the Fersina valley mining district of Trento province, at Montesei di Serso and Croz del Cius: a furnace was found at Montesei, together

with a Beaker-phase axe mould and type Ig II awls, and a furnace and slag were found at Croz del Cius ([Cierny et al. 1998](#), 26–27, figs 4–5).

SARDINIA AND CORSICA

The first development of metallurgy in Sardinia is still controversial ([Mellis et al. 2007](#)): copper and silver objects are known from Ozieri culture contexts datable to c. 4200–3500 BC ([Skeates 1994](#), 14), but claims of slag at the site of Su Coddù have not been confirmed by analysis. Evidence for metalworking is more secure in the Sub-Ozieri phase of the second half of the fourth millennium BC, with the finding of a crucible from the site; this phase sees the consolidation of metalworking in the southern part of Sardinia, with an increase in metal artefacts and a corresponding decrease in obsidian tools ([Skeates 1994](#), 29; [Lo Schiavo et al. 2005](#)).

The earliest metalworking in Corsica is from Terrina, a settlement dating to sometime between 3250 and 2400 BC ([Camps 1988](#); [Pearce 2013](#)). Little is known of third-millennium metallurgy in the island, though the archaeological record sees a move to defensive sites ([Lewthwaite 1985](#)).

MEDITERRANEAN FRANCE

Copper use and mining appear together around the late fourth/early third millennium BC in the Languedoc, west of the Rhône, where copper ores outcrop around the southern edge of the Massif Central. Chalcolithic copper mining and smelting are documented at a number of sites in the mining district of Cabrières (mines at Pioch-Farrus, Roussignole, and Bellarade, smelting at Roque-Fenestre and at the settlement of La Capitelle du Broum) ([Ambert et al. 2009](#)). Here tetrahedrite fahlore was mined with hammerstones and firesetting; the copper produced, rich in antimony and silver, is typical of Chalcolithic copper in the Languedoc. Further west, hammerstones and Chalcolithic (or Bronze Age) pottery have been found at the mine of Bouco-Payrol whilst smelting of copper sulphide at Al Claus (dated 2470–2200 BC) suggests mining of the local Chalcopyrite ores of the Villefranche-de-Rouergue fault ([Ambert et al. 1998](#); [Mille and Carozza 2009](#), 153–156, 162–164).

Radiocarbon dates are lacking for the earliest metalwork to the east of the Rhône, in Provence, where the first copper objects, such as the Remedello-type dagger from Orgon ([Courtin and Sauzade 1975](#)), may be imported. In the second half of the third millennium copper

metalwork becomes more common in Provence, with beads, awls, some flat axes, and daggers.

Mining of bornite, a copper rich sulphide, is documented in the second half of the third millennium BC at Saint-Véran, high in the Alps. Organic preservation is good, with wooden props or shoring and goat-horn picks preserved along with stone hammers and picks; firesetting was probably used. Ore processing (beneficiation) and smelting was carried out at the Pinilière rock shelter next to the mine and some 350m below at La Cabanne des Clausis (Barge et al. 1998). The site lies 3km from the Italian border and local rock engravings depict Remedello daggers, suggesting that the miners may not have come from the French side of the Alps (Mille and Carozza 2009, 159).

Statue-menhirs depicting warriors with copper weapons may, like the Italian stelae, have depicted ancestors (D'Anna 1998), and the rock engravings from Mont Bégo in the Alpes Maritimes depict Chalcolithic copper weapons, many of Italian types.

Although Chalcolithic copper artefacts (beads, daggers, flat axes, awls) and evidence for metalworking are abundant in Languedoc in early third-millennium contexts, they are mostly small and decorative, occurring primarily in tombs in the uplands close to the copper outcrops; metal tools do not replace stone and bone artefacts (Gutherz et al. 2005; Mille and Carozza 2009, 160–161). Whilst production at Al Claus was low-level, domestic, and probably occasional, at Cabrières it was on a different scale and seems to correlate to the development of fortified settlements nearby, such as Puech Haut and Roquemengarde (where the earliest metal objects are found); however, metal production and the distribution of products seem to be regional in scale (Mille and Carozza 2009, 165–168). In the second half of the third millennium BC, Beaker contexts are relatively poor in metalwork (Ambert 1998, 67–68), though Palmela-type points seem to document trade in finished objects from Iberia.

CONCLUSIONS

The social role played by copper artefacts and metallurgy in the late Neolithic and Chalcolithic societies of the western Mediterranean is not as simple as current models maintain. As we have seen, copper may not always have been valuable in the earliest periods of its use, and there may have been rather more in circulation than is attested by the archaeological record. This suggests that whilst Chalcolithic elites certainly used copper artefacts to express their wealth and identity, on the present evidence we cannot say that metallurgy and metalwork played an important causative role in the emergence of social

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CHAPTER 37

EARLY METALLURGY IN WESTERN AND NORTHERN EUROPE

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INTRODUCTION

THE division of European prehistory into Stone Ages and Metal Ages reflects the traditional emphasis on artefact studies and prehistoric technology in recognizing social change. The increasing detail with which we are able to visualize and analyse the past has, to some degree, supplanted this technological focus with a sociocultural one. Whilst this requires that technological developments no longer be used as proxies for social changes, in practice, archaeologists working on material culture tend to become experts in a single material and the techniques used specifically to study it. Thus, the adoption of metal objects and metallurgy is still viewed as a special and highly significant technological milestone in European prehistory, and is analysed in relative isolation to other contemporary materials and technologies. This singular perspective ensures that any explanations concerning the appearance and characteristics of early metal are, at best, partial and, at worst, based on inaccurate assumptions.

The earliest presence of metal objects in north-west Europe during the fourth millennium BC does not herald the beginning of any material or technological transformation. At the end of the Neolithic, objects in eye-catching and exotic materials were widespread; metal—copper and gold—was adopted as part of this trend. Moreover, the processes of transmitting metallurgical knowledge were probably similar to—and perhaps occurred in concert with—other methods of teaching and learning technical information. It was clearly not regionally uniform, nor highly or centrally organized, as local styles proliferated and metal use itself went in and out of fashion in different places at different times. Early metal objects represent a consequence of the desire for exotic forms and materials, including amber beads and polished stone/flint axes, evident throughout the region at the time. The first metal objects in north-west Europe fall into three

groups: sheet metal trinkets, flat axes, and atypical forms with few or no parallels. The contextual evidence is unclear for each group, though trinkets tend to come from funerary contexts whilst the other two groups occur frequently singularly or in hoards. The primary production process seemingly took place far from north-west Europe. Whilst metal became a highly significant material in this region during the second millennium BC, its incorporation into existing technological and social contexts began nearly two millennia earlier and had little immediate impact on the communities involved. Thus, the first step in understanding the spread of metal and metal technology into northern and western Europe is to understand the larger technological and material context.

CHRONOLOGY AND GEOGRAPHY OF METAL IN THE FOURTH AND THIRD MILLENNIA BC

From the late fifth millennium BC, traces of metallurgy in north-western Europe—France, Benelux, the Low Countries, parts of the north European and Baltic regions, Britain, and Ireland (Fig. 37.1)—grow more pronounced and are more easily identified and analysed. Metal ores in this region are relatively scarce, with copper ore sources known in south-east and north-west France, western Britain, Ireland, and the Alpine region. Gold, the other metal in circulation during the Neolithic, is similarly limited to Ireland, western and northern Britain, and southern France. Whilst lead ore is relatively widespread, its exploitation has not drawn much archaeological interest, as there is little evidence for its use outside south-east France and possibly Wales (Timberlake 2009) from the late fifth to the third millennia BC. Tin ore (cassiterite) is widely available only in south-west Britain, north-west France, and isolated locations in Ireland and southern France. Consequently, the vast majority of north-west Europe has no direct access to local ore sources; almost all known metal in these regions must have been carried in and worked at some distance to its point of origin, owing to the variety of local forms.

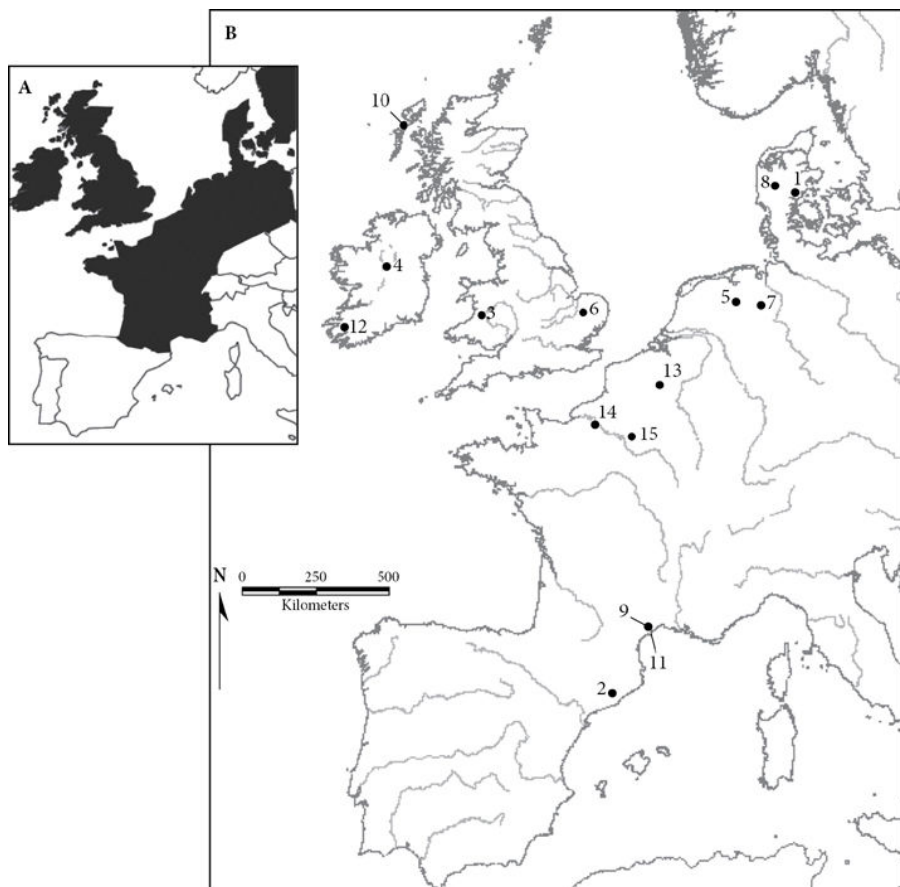


FIG. 37.1. A: Study area (shaded region); B: Selected sites mentioned in the text. 1. Bygholm, Skanderborg, Denmark (Bygholm Hoard); 2. Can Tintorer, Catalonia, Spain; 3. Copa Hill, Cwmystwyth, Wales; 4. Corlea, Longford, Ireland (Corlea-6 trackway); 5. Emmeln, Niedersachsen, Germany (Emmeln-2 megalithic tomb); 6. Grime's Graves, Norfolk, England; 7. Hude, Niedersachsen, Germany; 8. Kideris mose, Herning, Rinkøbing, Denmark; 9. La Capitelles du Broum/Vallarade/Roque Fenestre, Languedoc, France; 10. Northton, Isle of Harris, Scotland; 11. Roquemengarde, Languedoc, France; 12. Ross Island, Cork, Ireland; 13. Spiennes, Mons, Belgium; 14. Val de Reuil, Normandy, France; 15. Vignely, Seine-et-Marne, France.

Metal objects

There are very few well-dated metal objects in north-west Europe and no clear pattern for the distribution of the earliest examples. Copper beads thought to comprise a necklace and dated to 3517–3357 BC were excavated in a funerary context at Vignely, Seine-et-Marne in north-central France (Mille and Bouquet 2004; Mille and Carozza 2009). Similar trinkets (small ornaments) in copper, globular lead

beads, and fragments of copper awls were excavated at Roquemengarde, Languedoc, in southern France and dated to the mid-fourth to early third millennia BC (Guilaine 1991; Ambert et al. 2002). Elsewhere in southern France several typologically early metal artefacts characteristic of other regions have been excavated, including northern Italian ‘Remedello’-style daggers, western Swiss-style spiral pendants, and even a gold repoussé diadem whose closest parallels are in the Balkans, raising the possibility of earlier dates for metal objects in the region (Eluère 1982, 56; Guilaine and Eluère 1997, 176; Ambert and Carozza 1998, 160–161). North of the Alps, a number of metal objects are known from contexts typologically dated to the fourth millennium BC. Ottaway’s (1973) catalogue (primarily copper) trinkets includes crescent-, disk-, and trapeze-shaped pendants, rings, and a number of spirals or wound strips of sheet metal; but, in much of the area, traces of metal use prior to the mid-third millennium BC are sparse and occasionally quite controversial (see also Klassen 2000; Krause 2003). All known metal finds are sheet copper trinkets from funerary contexts. The finds from the Emmeln-2 megalithic tomb (Haren, Niedersachsen) are among the best known. They include four heavily weathered flat disks 4–6cm in diameter found together in a decorated bowl, a spiral 1cm in diameter made from a wound strip of sheet copper, a rolled up sheet of copper, and a small copper tube found with some amber beads (Schlicht 1968). Fourth-millennium BC copper is significantly more prevalent and better-documented in southern Scandinavia. Klassen (2000, 2004) recorded over 100 copper objects—primarily trinkets, but also flat axes and other object types—dated by context and style to the fourth millennium BC. The most famous is arguably the Bygholm hoard found near Horsens (Jutland, Denmark) and comprising three copper arm spirals, four copper flat axes, and a copper dagger blade all placed with a decorated Funnel Beaker pot into the Bygholm river (Klassen 2000, Catalogue #94) (Fig. 37.2).



FIG. 37.2. Copper objects from the mid-fourth millennium BC hoard found at Bygholm, Skanderborg, Denmark. These metal artefacts were found with a fragment of funnel beaker pottery.

(Photograph by Lennart Larsen, the National Museum of Denmark).

In northern Europe and the Alpine area, a substantial break in the supply of copper objects around 3200–3000 BC apparently severely reduced the quantity of copper in circulation. This hiatus may reflect a disruption in access to a primary ore source ([Ottaway 1989](#)). The reduced quantity of archaeologically visible metal objects may have been partly due to changing depositional practice in light of the increasing rarity of imported metal ([Klassen 2000](#), 273). This hiatus in use—or deposition—of metal objects is noticeable throughout north-west Europe, where metal, or at least its archaeologically visible deposition, goes entirely out of fashion during the first half of the third millennium BC.

The situation in the British Isles and Ireland was quite different, as metal was not circulated in any consequential—or archaeologically visible—amounts until the mid- third millennium BC ([Needham 1996](#); [Fitzpatrick 2011](#)). Copper and gold objects were placed in funerary contexts and hoards whilst the Corlea 6 wooden trackway in the Irish Midlands, dendrochronologically dated to 2259 ± 9 BC, sports marks produced by a metal axe ([O’Sullivan 1996](#)). This circulation of gold alongside copper challenges the broader observation that the earliest gold objects beyond the Mediterranean date only to the late third

millennium BC ([Hartmann 1970, 1979, 1982](#); Elèure 1982; Primas 1995) ([Fig. 37.3](#)).



FIG. 37.3. Irish style hammered sheet gold lunula (found at Gwithian, Cornwall, Britain).

(Photograph by the British Museum).

Metal production technology

From the mid-third millennium, metal production becomes archaeologically visible throughout western Europe, as copper, copper-alloy, and gold objects were produced and deposited in much greater numbers. However, early copper smelting only left very ephemeral traces and we may well be unable to identify the earliest generations of smelting or experimentation archaeologically ([Timberlake 2005](#)). The evidence for metal production is restricted to copper mining, ore refining, and smelting, and is only found at a handful of geographically distant sites. The earliest and by far the

richest copper production traces have been excavated in Languedoc, southern France: the Vallarade copper mine dates from c. 3100 BC and is virtually contemporary with the earliest copper smelting at nearby La Capitelle du Broum (Mille and Carozza 2009) and ore processing at Roque Fenestre, Pioch Farrus 448 (Espérou et al. 1994). Production evidence elsewhere in France is limited to two copper droplets from a hearth at Val-de-Reuil, Seine Valley, dating to the late third millennium BC (Billard et al. 1991; see Meurkens 2004). Elsewhere, much of the best production evidence comes from Ireland and Wales, but consists primarily of copper ore mining activity, with several sites in use during the mid- and late third millennium BC. Of particular interest is the copper sulphide ore extraction and possibly smelting in south-west Ireland at Ross Island c. 2400 BC onwards (O'Brien 2004) and mining traces at Copa Hill, Cwmystwyth, Wales c. 21/2000 BC and potentially slightly earlier nearby at Erglodd (Timberlake 2009). The only other broadly contemporary evidence for metal production is a splash of arsenical copper in a midden at Northton (Isle of Harris) in Scotland, dated to the late third millennium BC (Simpson et al. 2006).

The limited nature of the fourth and third-millennia metal corpus must be taken into account when discussing the spread, type, and variety of early metal production. For instance, there are c. 150 fourth-millennium BC copper objects from southern Scandinavia (Klassen 2000, Katalog); c. 700 mid to late third millennium BC copper and bronze objects in Ireland (O'Brien 2004), and c. 1,400 late fourth to mid-third millennium BC copper objects in eastern Languedoc, south-east France (Gutherz and Jallot 2005). Metal may well have been extensively recycled, though this is difficult to detect (Bray 2012; Bray and Pollard 2012). The metal objects we study represent only those items which were carefully deposited and neither decayed nor were looted or recycled over the past 4,000–6,000 years (cf. Taylor 1999). Thus, all conclusions drawn from this fragmented and non-representative corpus are biased by the choices made by people in prehistory (whether to recycle/curate metal objects and where/how to deposit them), as well as the decisions of farmers, antiquarians, and archaeologists.

The chemical and isotopic compositions of these earliest metal objects often indicate patterns of circulation and points of origin for the objects and raw materials in circulation. In south-east France the evidence indicates the exploitation of a single ore source over several centuries, since high silver and antimony compositions match lead isotope data and point to the ores at Cabrières (Ambert 1999; Prange and Ambert 2005). The copper objects of the North European Plain demonstrate a signature of high arsenic and low silver (Ottaway 1973, 1989). Scandinavian copper is compositionally comparable to the rich

Alpine ores (Klassen 2000, 2004); and lead isotope analysis links one specific metal type, Riesebruch copper, to Alpine sources (Klassen and Stürup 2001). Finally, the vast majority of copper objects in Ireland and western Britain are high in arsenic and antimony, which together with the objects' lead isotope signature suggest raw materials from the Ross Island ore body (Coghlan and Case 1957; Case 1966; Rohl and Needham 1998; O'Brien 2004). In contrast, the recent re-analyses of compositional data in eastern Britain and north-west Europe suggests that the main copper in circulation, originally termed 'Bell Beaker metal', was formed by mixing metals from two obviously distant geological sources, one perhaps as far as northern Spain (Needham 2002). Hence, it is important to note that whilst metal types can be tentatively identified, the chemical composition of the finished object gives no information as to whether the raw material or the finished product was being circulated.

THE SPREAD OF NEOLITHIC METAL USE IN NORTH-WEST EUROPE

Metal travelled extremely long distances from where it was mined and the development of local secondary production clearly shows that at least some metallurgical knowledge went with it (Roberts 2008b). Although distribution maps reflect only those objects which, through taphonomy and happenstance, could be recovered in archaeologically meaningful ways, recent continental syntheses have pointed towards the importance of river systems in facilitating long-distance movement (e.g. Klassen 2004, fig. 145; Sherratt 1996). Moreover, wheeled transport and animal traction probably developed throughout much of north-west Europe in the late fourth and early third millennia BC. Wooden carts—presumably ox-drawn—were in use from the early third millennium, as a solid wooden wheel found in Kideris Mose, Denmark and dated 2880–2700 BC implies (Nielsen 1993). Similar wooden wheels, cart fragments, and iconographic representations of animal traction in Italy and central Europe slightly pre-date this example, placing the advent of animal traction squarely in the late fourth millennium BC (Sherratt 2006). It is more difficult to assess how the technology itself travelled. A process of learning and teaching at an exploitable ore source must have been necessary to communicate the various stages of metal production. An individual or a group able to initiate metal production would then move to another ore source. There are comparable metallurgical practices at earlier dates to the east, not only negating any concept of independent invention in western Europe but also implying that this was the

continuation of a punctuated, pan-European transmission process (see [Roberts 2008b](#); [Ottaway and Roberts 2008](#); [Roberts et al. 2009](#)). The techniques of extracting, preparing, and smelting ores as well as casting, working, and shaping objects were similar throughout north-west Europe. However, one must doubt the uniformity of this training across western Europe. Presumably learning metallurgy was structured in ways similar to learning other technical skills (e.g. [Brodie 1997](#); [Högberg 2008](#)), and it likely varied in significance from one region to the next.

The initial influx of metal into north-west Europe was not immediately followed by a growing metal industry, a marked increase in metal production and deposition, or even a developing appreciation for metal as a material with unique and novel properties. Rather, after several centuries of extremely sporadic deposition (and probably varying local secondary production), metal fell out of fashion and presumably circulation in northern Europe from 3200–3000 BC and north-west continental Europe from 3000–2500 BC (cf. [Krause 2002](#), 34). Similar patterns exist in other materials; for example, in the British Isles during the fourth millennium BC, jet and amber saw an initial flush of popularity, then fell out of use for several centuries before regaining their significance in the mid-third millennium BC.

South of the Loire river, the appearance of early metal objects—such as at Roquemengarde—was swiftly succeeded by growing centres of primary and secondary metal production elsewhere which remained in use through the early third millennium BC, perhaps due to connections with the larger Mediterranean communication and exchange network. In fact, the presence of large quantities of copper beads, awls, pendulums, and flat axes in the late fourth to mid-third millennia BC contrasts with far fewer copper objects produced in the region during the second half of the third millennium BC, when the earliest metal objects and metal production become archaeologically visible in Ireland, Britain, and the near continent. These trends cannot solely be explained by the development of new metallurgical techniques, but also involved the transmission and adoption of practices, objects, and presumably ideologies related to the so-called ‘Beaker package’ (see [Vander Linden](#), this volume). Thin-walled Beaker pottery with an S-shaped profile and banded decoration was frequently accompanied in graves by polished stone bracers, finely made flint arrowheads, v-perforated buttons in diverse materials (possibly part of special adornment for the dead), and/or daggers in copper, flint, and occasionally other materials ([Fig. 37.4](#)). The ability to recognize and acquire these raw materials, the craft required to form them and to suitably prepare or ornament their surfaces, would have been fundamental for replicating and recreating this new set of

practices and beliefs. During the late third millennium BC, the exploitation of gold, copper, and, later, bronze was inextricably tied to this social focus on the manipulation of diverse, exotic, and often eye-catching raw materials to make a socially circumscribed set of objects presumably used in many ways but found primarily in funerary contexts.



FIG. 37.4. Bell Beaker burial assemblage with copper tanged dagger, bone/ivory toggle and polished stone wristguard with sheet gold caps (found at Barnack, Cambridgeshire, Britain).

(Photograph by the British Museum).

THE ROLE OF METAL AND METAL TECHNOLOGY IN NEOLITHIC SOCIETY

The number of copper objects produced in north-west Europe over the centuries prior to 2500 BC was not large, and more indicative of an occasional rather than continuous production process. Metal was used differently at different times for conveying certain messages; and its frequent association with exotic, eye-catching, and presumably highly valued materials in socially significant contexts (i.e. hoards and

burials) marks it out as part of a special and distinct class of material culture. Only small numbers of metal objects circulated at any one time. Yet, copper and gold objects continue to be accorded an overly special significance in many publications and are assumed to have held inherent, frequently unspecified value for prehistoric communities. This is implied in familiar interpretations such as its use for prestige and control by elites (see [Bartelheim 2007](#) for review and discussion). The tendency has been to look for detectable changes in Neolithic societies due to the influence of metal production and consumption. However, metal probably did not carry quite the importance or prestige in prehistoric communities that we imagine. The lack of evidence for metal production at least partly reflects its sporadic nature. Existing evidence suggests metal working was engaged in by part-time practitioners and not dedicated ‘professional’ smiths until the mid-second millennium BC. This non-specialist production underlines the status of metalwork as a normal, not exceptional, part of the larger material assemblage (cf. [Bartelheim 2007](#)). Moreover, early metal tools did not provide an advantage over existing materials in performing everyday tasks. It should not be assumed that the flat axes were simply regarded as tools, rather than valued for their appearance as metal trinkets were. Not only were they less effective than their polished stone and flint counterparts ([Mathieu and Mayer 1997](#)), but many of the earliest were not even fully work-hardened and demonstrate few signs of intensive use.

Metalworking techniques such as casting, cold working, and annealing, or the repetition of metal forms, demonstrate a marked technological and aesthetic conservatism. Metalworking in the fourth and third millennia BC was not a dynamic or innovative technology, but practised sporadically and at small scale to traditional specifications and in order to meet relatively simple requirements (i.e. for the production of copper flat axes or trinkets). There is no evidence of a linear appreciation in the amount of metal from the fourth millennium BC: rather, the hiatus *circa* 3000–2500 BC must be accounted for. Choices about the forms and uses of metal objects reflect existing social desires ([Roberts 2008a](#)). For example, Irish copper flat axes mimic in form and depositional context the polished stone axes in circulation in preceding centuries (e.g. [Cooney and Mandal 1998](#)). In a nearly identical process, late third millennium BC copper axes in southern Scandinavia took on many of the social functions of thin-butted flint axes ([Vandkilde 1996](#)). In this region, copper and later bronze were almost entirely restricted to one form (the flanged axe) and depositional context (the hoard) for at least the first 200–400 years of their (reasonably) widespread use, in contradistinction to flint (particularly daggers) which continued to be

deposited in settlements, burials, and hoards well into the second millennium BC (Frieman 2012a, 2012b; Vandkilde 1996). Copper, gold, and lead were first used in southern France at a time when beads of various materials, including horn, bone, variscite, and shell, were a significant part of the dominant funerary rite (Barge 1982). Furthermore, the mid-third millennium BC rationalization and standardization of the metal corpus can be tied to the social needs expressed in the widespread Bell Beaker funerary rite (Ambert 2001; Vander Linden, this volume).

It is commonly believed that metalworking was complex and required the development of complex social structures—such as the emergence of status distinctions or formal apprenticeships—not necessary for other prehistoric technologies (Strahm 1994, 2005; Krause 2003). However, many of the other materials used during this period, and used far more frequently than metal, required multi-stage production processes of comparable complexity. Knapping flint requires significant experience of the material's unique physical properties; and producing the complex and regular tools characteristic of the fourth and third millennia BC necessitates a period of learning, probably facilitated by an older or more capable flint knapper (see De Grooth, this volume). From the fourth and into the third millennia BC, flint was mined in deep shafts across north-west Denmark and beyond (see Capote and Díaz-del-Río, this volume). Mining and prospecting for special rock sources was not limited to flint, as axes of jadeite quarried from isolated outcrops in the Italian Alps circulated throughout western Europe from the sixth millennium BC (Pétrequin et al. 2008; Klassen 2004; Sheridan 2007), variscite was mined for use as ornaments at sites like Can Tintorer, Spain (Blasco et al. 1998), and haematite sources across the Black Forest region of Germany were exploited from the fifth millennium BC (Goldenberg et al. 2004). None of the mid- and late third millennium BC copper mines known in western Europe reflect the levels of technical and logistical complexity or scale of many of these earlier mines.

Neither did metal production require many new skills. One way of improving the workability of flint and chert is to heat it carefully (not enough to vitrify it, but enough to affect the chemical matrix) before knapping (Whittaker 1994). Similarly, firing pottery requires closely controlled temperatures—especially in the production of the fragile, thin-walled Beaker pottery. Although we cannot adequately reconstruct prehistoric pyrotechnologies, they were clearly more complex than the unthinking use of simple cooking fires or open bonfire kilns. We equally lack a proper understanding of the technologies of producing and using organic materials, but these were probably involved in complex *chaines opératoires* requiring

sophisticated appreciation of the materials involved. A large part of the ground-stone tool assemblage of the third and fourth millennia BC was probably produced for use as wood-working tools (Fokkens 1998; Louwe Kooijmans 2005, 255), whilst the applewood hammer with a handle in ash from Hüde I suggests the sophistication of fourth-millennium woodworking: the different woods were selected for specific tool parts based on their differing strength, flexibility, and sturdiness (Louwe Kooijmans 2005, 268). Similar planning and chains of practices were involved in cultivating fibrous plants and preparing wool for weaving, and in the complex dying and weaving processes hinted at by the few scraps preserved in water-logged contexts (Hurcombe 2008; Harding 2000, 254; Bender-Jørgensen 1992). The appearance of new dress ornaments in western Europe, such as pins, belt-loops, and v-perforated buttons, suggests a shift toward sewn woollen or linen clothing (Bender-Jørgensen 1992). Finally, some of the most basic prehistoric technologies, such as grinding corn for food or temper for adding to potting clay, have potential applications in metalworking, such as ore refining and roasting.

The contexts of use and deposition for early metal objects fit into a broad class of ‘special objects/materials’, such as highly polished hard-stone axes and amber. These objects share certain physical properties including lustre, brilliance, distinctive colour, and non-local or hard-to-access points of origin (chapters in Jones and MacGregor 2002; Pétrequin et al. 2002, 2008; Klassen 2004). Often these objects were treated in ways that distinguished them from the rest of the material in circulation, such as the hoards and deposits of hundreds or even thousands of amber beads alongside polished flint axes and Funnel Beaker pottery in southern Scandinavian bogs (Ebbesen 1995). Similarly, extremely long polished flint axes from Scandinavia were deposited in hoards in wet places in the Netherlands and north-west Germany during the fourth millennium BC—apparently after having been rubbed with red ochre (Wentink 2006). Alpine jadedite axes circulated as far north as Scotland and Denmark, being reshaped and re-polished into significant local forms as they travelled (Sheridan 2007; Klassen 1999). This situation is comparable to the re-melting of metal objects and their re-creation in regionally and locally desirable forms. If metal *had* been conceptually distinct from all other materials, then the forms throughout north-west Europe should not reflect local patterns but rather emulate a universal idea of ‘metal.’

CONCLUSIONS: UNDERSTANDING NEOLITHIC METALWORK IN NORTH-WEST EUROPE

Whether perceived as a technological or a chronological change, the appearance of metal tends to push scholars into proposing social transformations by the communities involved in its use and manufacture (cf. [Roberts and Frieman 2012](#)). One consequence of this metal-orientated perspective is the debate over whether we should recognize a Chalcolithic period across Europe and beyond, dividing the Neolithic from the Bronze Age ([Allen et al. 2012](#); [Brindley 1995](#); [Guilaine 2006](#)). Another is the proliferation of projects researching the earliest metal objects and metal production practices. These projects have generated sufficient data, not only to re-analyse metal on its own terms, but also to allow meaningful comparisons to other contemporary materials and technologies, enabling the many interpretations and assumptions concerning the ‘spread’ and ‘development’ of metal to be re-evaluated (see [Thornton and Roberts 2009](#) and chapters in *Journal of World Prehistory* 22, 3–4).

Metal objects in the fourth and third millennia BC in northern and western Europe represent only one of several exotic and visually distinctive materials exploited and shaped in different ways by distant communities. Whilst the earliest metal can be regarded as special in the sense that it may have been desirable for adornment and display, it seemingly did not exert any causal influence on the dynamics underlying the communities involved and conveyed no obvious technological advantage. The ability to create copper and lead objects from their ores or melt copper or gold from naturally occurring nuggets was not invented independently in northern or western Europe. However, there were at least partially comparable technologies in terms of technical complexity, logistics, and pathways of transmission. When metal production did occur, it required specialist expertise, but was only applied on a small-scale and sporadic basis with little innovation or intensification. Production may not even have occurred in many regions during certain periods, and there is little sense that the desire to learn the new technology created a demand for metal to fill roles beyond its circumscribed place in the new ideologies and lifestyles which stimulated its consumption. In conclusion, the early presence of metal does not herald a revolution, but instead represents a single material that has survived through the millennia to be relatively well studied by scholars who, perhaps, attach more significance to its appearance than any prehistoric person would have.

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CHAPTER 38

DEPOSITION IN PITS*

DUNCAN GARROW

INTRODUCTION

THIS chapter, somewhat unusually, focuses on a single type of archaeological feature—the pit. Neolithic pits in Britain are generally fairly small, usually measuring less than two metres in diameter and a metre in depth (Fig. 38.1). Normally, their fills contain charcoal-rich material, along with broken pottery, flint debris and tools, burnt flint, burnt stone, charred hazelnut shells, charred seeds, and bone. Often, these materials simply appear to have been dumped into the pits. However, occasionally, more elaborate depositional practices—such as selecting apparently special objects, or carefully arranging certain items at the base of a pit—are identified.



FIG. 38.1. A cluster of early Neolithic pits at Kilverstone, Norfolk (1m scale).

(Photograph: D. Garrow).

Pits are, of course, found on Neolithic sites right across Europe, mostly in association with other archaeological features—alongside longhouses or cut into the floors of mud-brick tells, for example (see e.g. Last, this volume; Raczky, this volume). Across Britain, however, numerous sites exist which consist *only* of pits, sometimes in very large numbers (Thomas 1999, ch. 4; Garrow 2006; Anderson-Whymark and Thomas 2012). Over the past twenty years, there has been a substantial increase in the number of known pit sites through developer-funded archaeology. This has ensured that pits are now incorporated into accounts of the British Neolithic, providing an important counterweight within a period which has predominantly been discussed through monuments.

On many pit sites in Britain, no evidence survives of the houses, settlement enclosures, and other features with which it is presumed the pits were once associated. In many regions, what we know about Neolithic occupation—and in some cases, the Neolithic as a whole—we must deduce from pits. The absence of evidence for dwelling structures across large parts of Britain, especially the south and east, has forced Neolithic archaeologists to problematize the way in which ‘settlement’ worked at that time (e.g. Gibson 2003). Generally speaking, the absence of archaeologically visible houses, and the supposedly ephemeral evidence that pits are usually seen as representing, have been taken as suggesting that settlement itself was mobile, impermanent and relatively small-scale (e.g. Pollard 1999; Thomas 1999).

In Britain, the creation of pits, and subsequent deposition of material culture within them, appears to have been a practice particularly associated with the Neolithic. Whilst some Mesolithic pits are known, most famously those in the Stonehenge car park (Allen and Gardiner 2002), they are relatively rare. Similarly, during the early Bronze Age, the number of pits drops substantially. Whilst pits were dug continually right through to the modern period, from the middle Bronze Age (c. 1500 BC) onwards they tend to represent one of a range of features, rather than the entirety of one site. Their role, it seems, had changed by then.

NEOLITHIC PITS IN BRITAIN: SPATIAL AND TEMPORAL VARIABILITY

It is important to point out that ‘deposition in pits’ is far from a

uniform phenomenon during the British Neolithic. Whilst pits are known right across Britain at this time, they do not occur in anything like uniform numbers geographically ([Garrow 2012a](#)). Intriguingly, they appear to be relatively sparse in the areas where post-built structures are more common, such as Scotland and north-west Wales. The greatest density of pit sites is in eastern England, where there are very few convincing structures; the region has also produced the majority of the largest sites (several with more than 50 pits). In eastern England, these very large clusters mostly date to the early Neolithic, and are associated with Mildenhall pottery ([Garrow 2006, ch. 3](#)). By contrast, in the middle Thames valley, only twenty early Neolithic pits have been found, with pit digging really only taking off during the middle Neolithic, in association with Peterborough Ware ([Lamdin-Whymark 2008, 123](#)). In Wessex, the picture is different again: the early Neolithic is characterized not by very large sites, but rather by massive deposits of material within single pits, as at Coneybury and Rowden in Wiltshire ([Richards 1990](#); [Woodward 1991](#)). Late Neolithic pits associated with Grooved Ware pottery are the most numerous in this region ([Thomas 1999, 69](#)), as they are on the comparable chalk geology of East Yorkshire ([Manby 1999](#)).

As well as this spatial variation, deposition in pits is characterized by considerable variability over time and between contexts, even within regions. In eastern England for instance, during the early Neolithic there is no clear patterning in what was deposited or how it was placed within a pit. However, over time, there is evidence that the act of deposition became more stylized: during the late Neolithic, certain objects were apparently selected preferentially and, at times, very clearly arranged within the pit. Intriguingly, this is diametrically opposite to what happens in monumental contexts, where deposition became less stylized over the course of the Neolithic ([Garrow 2007a](#)). Similarly, in the Thames valley, different types of deposition predominate in different contexts at different times ([Lamdin-Whymark 2008](#)).

Overall, it seems that whilst the idea of digging pits and putting material within them was important to people across many areas of Britain during the Neolithic, the ways in which this practice was actually played out varied considerably over space and time, and between different contexts.

HOW HAVE PITS BEEN INTERPRETED?

As archaeologists, we dig a variety of different feature types: ditches, post-holes, hearths, graves, floors, walls, wells, pits. Most of these

words have implicit associations or preconceived meanings: a ditch demarcated a specific space, perhaps around a field or settlement; a post-hole housed a wooden timber upright and probably formed part of a building; a hearth was a place of warmth, fire, and cooking; a grave contained a burial and perhaps artefacts; and so on. The word 'pit', on the other hand, is reserved for features which do not have an immediately obvious meaning or role. It remains ambiguous, and so has to be qualified for us to understand its nature: a 'cremation' pit, a 'rubbish' pit, a 'cess' pit or 'quarry' pit. Pits can be dug for a 'bewildering number of purposes' (Greene 2002, 120). During the Neolithic, the purpose of pits certainly proves difficult to pin down. They are not easily categorized. Over the years, this ambiguity has resulted in a rich diversity of interpretations.

During the nineteenth and early twentieth centuries, pits featured only occasionally in narratives of the British Neolithic. Generally, where they were discussed, the notion that they must have been primitive 'pit dwellings' predominated (e.g. Pitt Rivers 1898; Wyman Abbott 1910), an idea which sat comfortably with social evolutionary views of the Neolithic at that time. In the 1930s and 1940s, interpretations broadened somewhat. The pits found at Clacton in Essex, for example, were viewed as being either 'surface occupation or camp sites', 'cooking holes' or 'hearth sites', as well as possible 'pit dwellings' (Warren et al. 1936). Two pits found in a garden 300 yards from the famous timber monument at Woodhenge in Wiltshire also initiated new interpretations. The fact that these contained unused axes, arrowheads, and bone pins, alongside large slabs of Grooved Ware, suggested to Stone and Young (1948, 302) that 'their use must be susceptible of interpretations other than mere refuse pits'. They went on to suggest, somewhat creatively, that 'possibly we have the remains of sacred feasts held in the [Woodhenge] enclosure and considered in consequence too hallowed for normal disposal and demanding special ritual burial' (Stone and Young 1948, 305).

Throughout the 1960s, assumptions linking the Neolithic with a 'package' of full-scale mixed farming, pottery production, new stone tool technologies, and permanent settlement underlay most interpretations. Excavations at Hurst Fen, Suffolk (Clark et al. 1960), for example, aimed to recover the long-awaited 'Neolithic settlement'. Although 200 earlier Neolithic pits were excavated, none of the expected structures were there. Their total absence was not seen as particularly problematic, being explained away as a consequence either of house construction techniques, or of the fact that people lived in temporary tents (Clark et al. 1960, 205).

The publication of Hurst Fen nevertheless significantly changed the way pits were approached. For the first time, a major site containing

pits alone had been found. Confronted by such an impressive number of them, the excavators were forced to think about exactly what those pits might have been for. Through comparison with similar, basket-lined pits in Egypt, and no doubt also influenced by understandings of the Iron Age, they concluded that the features at Hurst Fen were ‘best interpreted as storage pits’ (Clark et al. 1960, 211). The material within them was of secondary importance, seen as rubbish simply filling convenient hollows. With occasional exceptions, the storage pit interpretation dominated until the early 1990s.

Thomas’s book *Rethinking the Neolithic* (1991) represents perhaps the key turning point in understanding Neolithic pits. Thomas devoted a whole chapter to describing a ‘genealogy of depositional practices’, suggesting that the intentional deposition of material culture in the ground represented a fundamental part of what it was to ‘be’ Neolithic. He also made a very convincing case that, unlike Iron Age ones, Neolithic pits were *not* suitable for grain storage (Thomas 1991, 63). As a consequence, he argued that pits were dug ‘specifically for the burial of particular materials, and backfilled immediately afterwards’ (Thomas 1991, 75). In later works, he introduced two further key concepts: that the digging of pits and deposition of material culture somewhere changed people’s relationship to that place (e.g. Thomas 1996, 166); and that the act of deposition had a ‘performative’ element (e.g. Thomas 1999, 69).

Since the late 1990s, many prominent Neolithic archaeologists in Britain have made sure to include pits within their accounts of the period (e.g. Edmonds 1999; Whittle 1999; Bradley 2007). Moreover, the arguments set out in relation to Neolithic pits in Britain have now influenced interpretations of other periods and regions. For example, Hill carried out a detailed and highly influential study of pit deposits in the Iron Age (Hill 1995), whilst Chapman (2000) investigated the concept of ‘structured deposition’ in pits (and elsewhere) in south-east Europe.

At the end of this brief history of pit interpretations, it is worth summarizing my view on why pits were dug and filled with material during the British Neolithic. It is, of course, difficult to reach an understanding of *why* people felt the need to excavate a pit and then fill it with domestic ‘rubbish’, particularly as those motivations may have varied over time and space. It was not, however, purely a desire to keep sites ‘tidy’, as large amounts of material were also generally left undeposited on the surface at pit sites. The fact that the appearance of pits (in the early Neolithic) coincides with the widespread occurrence of much larger excavated constructions, such as long barrows and causewayed enclosures, is notable. Indeed it can be argued that pits are one element of the much broader practice of

‘altering the earth’ (Bradley 1993) which characterized the Neolithic in Britain and beyond. Thomas’s point (1991, 75)—that the act of depositing material culture in the ground was simply an important part of ‘being Neolithic’—is certainly pertinent here. In the same way that material was deposited in monumental contexts, such as causewayed enclosures, during the early centuries of the Neolithic, so too was it deposited in what appear to have been more ‘domestic’ sites comprising only pits. It is also worth reiterating another of Thomas’s points—that the act of deposition may well have changed people’s perception of ‘place’ (1996, 166). In a world of newly cleared primary forest and relatively impermanent settlement (in some regions at least), people may have felt a desire to tie themselves, materially, to particular places. The act of placing the detritus of occupation in the ground at each visit may have maintained a sense of connection with that place when moving on, perhaps as often as every few months. By the same token, having buried some possessions within the ground, along with the memories and events those items were probably associated with, people may well have felt more drawn to that place next time they chose where to settle.

Whatever the motivations and effects of the practice, in many regions this subtle relationship between material culture, pits, and places appears to have been important to people for the two millennia or so of the Neolithic. It is, therefore, one which we must take very seriously when trying to understand human lives and practices at that time.

THE IDEA OF ‘STRUCTURED DEPOSITION’

Perhaps the most influential work on Neolithic deposition, ‘Ritual activity and structured deposition in later Neolithic Wessex’, was published in 1984 (Richards and Thomas 1984; see Garrow 2012b for a critical history of the concept of structured deposition), in the early days of post-processual archaeology. It was explicitly concerned with facilitating ‘a systematic approach to ritual, which ... allows the examination of both symbolism and structure as embodied in material culture and its deposition’ (Richards and Thomas 1984, 190). The authors analysed depositional patterning within the late Neolithic henge at Durrington Walls, Wiltshire. Those deposits were said to be ‘structured’ in a recognizable way because they had been produced as part of the ‘highly formalized, repetitive behaviour’ associated with ritual (Richards and Thomas 1984, 191). Material culture, particularly Grooved Ware pottery, it was argued, had been deposited in a way which conveyed complex ideas through ‘specific sequences and rules

applied to the contexts and associations of different objects' (Richards and Thomas 1984, 192).

With hindsight, and after over two decades of interpretive development, the paper might be criticized for artificially separating 'ritual' from other aspects of life (Brück 1999; Bradley 2005) and for assuming a very direct relationship between material patterning and intentionally constructed symbolic meanings. However, this work—and particularly the term 'structured deposition'—has had a lasting effect for very good reasons. Perhaps most important of all, the focus on 'rubbish' during the Neolithic made it of fundamental relevance to our interpretations.

The notion of 'structured deposition' has caught on particularly well in relation to pits, largely because, in contrast to causewayed enclosures, henges, etc. they usually have no clear 'function' other than deposition. As a result, the 'ritual' interpretation has been particularly easily applied. From our own perspective at least, the practice of digging small holes just to fill them with rubbish is undeniably strange. The idea of 'structured deposition' gave that practice a label. Richards and Thomas intended to provide a method to identify 'ritual' practices materially; the next step was to proceed to an interpretation. However, the success of the term has arguably led to that interpretive process being cut short. Its identification has *become the interpretation* in itself. It is now possible to excavate a Neolithic pit, identify 'structured deposition' (i.e. a strange Neolithic practice which we cannot understand) within it, and leave it at that. Whilst this provides an easy route out of a difficult situation, it is also unsatisfactory. To build a more complete understanding of deposition in pits, we need to move *beyond* the issue of 'structured deposition', to look at other aspects of the material within those features.

BEYOND 'STRUCTURED DEPOSITION'?

The remainder of this chapter explores some of the ways which allow us to move beyond simply identifying pits containing structured deposits. Acts of intentionally 'structured deposition' (*sensu* Richards and Thomas 1984) by no means occur in all pits. The influence and subsequent application of the concept has therefore resulted in a rather biased view. Primarily, I will look beyond the act of deposition itself at processes occurring one step further back in time: what can the material deposited actually tell us about what happened, and how it happened, on pit sites? First, I will investigate what happened to the material within pits prior to deposition, and what this can tell us about the character of settlements and how 'rubbish' was perceived. I

will then consider what the deposited material tells us about the character of occupation on pit sites, looking at how ‘much’ occupation these supposedly ephemeral sites actually saw. I will also show that pits as containers of significant ‘background’ information offer extremely important information in addition to that recovered from monumental contexts. Finally, I consider what the material dynamics of a site (e.g. where different parts of the same pot ended up) reveal about the character of occupation there. Many of my examples come from eastern England, which has produced the highest numbers of pits overall, and which I have studied previously in most detail.

The ‘pre-pit’ context

In this section, I concentrate on one individual site, Kilverstone in Norfolk ([Garrow et al. 2005, 2006](#)), as this focus enables a fruitful depth and detail of understanding. The site produced a very large number of pits (226 in total), containing over 2000 sherds of Mildenhall pottery and over 13 000 flints. Importantly, detailed analysis of the conditions of artefacts within the pits shed light on the character of the place in which those artefacts had been ‘stored’ prior to deposition.

The physical processes which had affected artefacts were similar across all assemblages. Substantial amounts of pottery and flint had been altered to varying degrees by burning and weathering ([Beadsmoore 2006; Knight 2006](#)). Similarly, hazelnuts and other seeds had only been preserved due to charring. Amongst the pottery, some sherds were burnt slightly, whilst others had been severely affected by heat. Similarly, most burnt flint pieces had probably been purposefully heated (in the process of cooking, to create temper for pottery, etc.), but some were only very lightly cracked, perhaps suggesting more incidental burning. Occasionally, burnt stones were also recovered, usually surrounded by charcoal and burnt flint. The pottery and flint had also weathered to different degrees: a number of flints had been severely frost-shattered before deposition, whilst many sherds’ surfaces had been eroded.

Crucially, in the case of both flint and pottery, burnt or weathered pieces could be directly re-fitted with unburnt or unweathered pieces ([Fig. 38.2; Knight 2006, 31](#)). This implies that between the breakage of pots or the knapping of flint, and the deposition of material within the pits, there was a delay during which some artefacts were subjected to heat or left open to the elements. Refits between differentially weathered or burnt pieces suggest transformation after breakage, but prior to deposition. A post-breakage, pre-pit context for the material therefore existed, where broken pots, flint-knapping debris, food

remains, and other materials accumulated. Widespread weathering on the material suggests that it had been left out in the open for some time, whilst burning on material in most deposits indicates fires or hearths nearby.

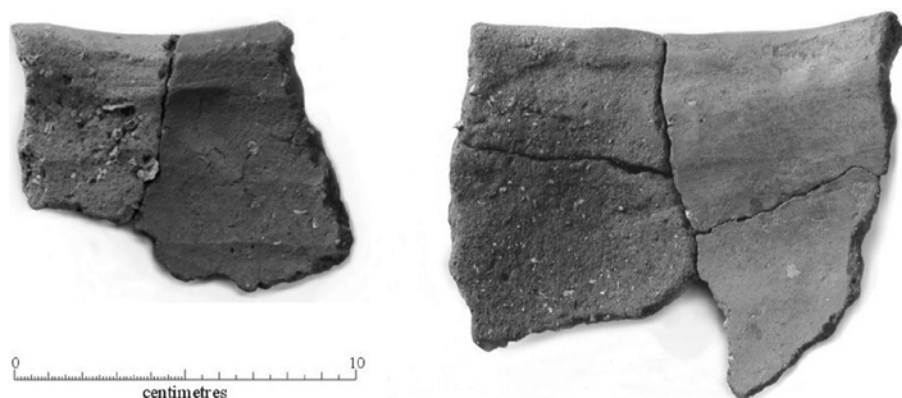


FIG. 38.2. Burnt/unburnt and weathered/unweathered refitting sherds from Kilverstone, Norfolk (Garrow et al. 2005, fig. 9).

(Photograph: M. Knight/D. Webb).

The exact nature of these pre-pit accumulations is difficult to describe. It is possible to imagine an area where the ‘mess’ of broken pottery and flint debris, hearths and cooking, hazelnut shells, and unneeded burnt flint was perhaps contained within demarcated ‘zones’. The artefacts nearest the fire were burnt, whilst those further away were not; those that ended up underneath others were protected from the weather, whilst those on the surface were exposed. Sherds were trampled, and flints trodden into the soil, leading to ‘incomplete’ assemblages. The material links between pits suggest that these pre-pit contexts were relatively limited in size, and changed location each time the site was occupied (see below).

The character of occupation

Detailed examination of the material within pits also allows a better understanding of how ‘much’ occupation these sites, often viewed as fairly ephemeral, witnessed. Despite the fact that large amounts of material never made it into the pits (in some cases arguably because items were specifically selected for deposition), it is nevertheless possible to use those elements which did to provide a rough estimate of how many people visited a site for how long (see also Garrow 2010).

In many cases, the association often made between pits and

ephemeral settlement is understandable. It is indeed hard to view a couple of shallow scoops containing a few scraps of pottery and flint flakes as the archaeological signature of anything more than a short visit to that place. However, a number of sites, particularly in eastern England, appear to signify occupation of a rather more substantial kind: at Kilverstone, 226 pits were recovered ([Garrow et al. 2006](#)); at Hurst Fen there were at least 200 ([Clark et al. 1960](#)); at Broom Heath in Norfolk there were 67 ([Wainwright 1972](#)); and at Spong Hill in Norfolk there were 56 ([Healy 1988](#)).

It is very difficult to link the number of pits on a site directly with the duration of occupation; people could well have dug large numbers of pits very quickly, especially as most sites are on soft sandy soils. However, the materials within those pits arguably do provide insights into the ‘amounts’ of occupation we are dealing with. On all sites with large numbers of pits in eastern England, there were large numbers of vessels. It is important to emphasize that all of these vessels were broken, and the vast majority were only partially represented (sometimes by very few sherds); clearly, substantial amounts of material never made it into the pits. At Hurst Fen, it was estimated that between 283 and 317 different pots were represented, at Broom Heath 272, at Kilverstone at least 150, and at Spong Hill 113 ([Clark et al. 1960](#), 228; [Wainwright 1972](#), appendix 3; [Knight 2006](#); [Healy 1988](#), Ch. 3). Interestingly, even on some sites with far fewer pits, the number of vessels represented was impressive. At Eaton Heath in Norfolk, for example, pieces of 26 different pots were found in just 12 pits, and at Hall Farm Reservoir in Norfolk a single pit contained the remnants of 12 vessels ([Wainwright 1973](#); [Birks 2000](#)).

As with the pits themselves, we must be cautious in reading the duration of occupation from the number of pots represented. Nevertheless, as there was no clear evidence that vessels had been deliberately smashed or brought specially to the sites for deposition, it does seem reasonable that the material within the pits resulted from occupation at these sites. I am usually reluctant to employ ethnographic analogy, as comparing practices of the archaeological past with those observed in the present usually ignores that we are dealing with entirely different contexts. However, remaining mindful not to make direct comparisons across such vast differences in context, I would nevertheless like to explore the rates at which pots are broken in contemporary (or near-contemporary) situations. These numbers are not ‘correct’, but provide us with a way of thinking through the quantities set out above.

As part of his study of deposition on Iron Age settlements, Hill carried out a wide-ranging survey of ethnographic and ethnoarchaeological studies investigating the rates at which pots are

broken (Hill 1995, 129–131). Based on evidence from a variety of contexts across the globe, he arrived at an average figure for the number of pots broken per ‘household’ per year of 5.4 (overall, numbers varied between 2.4 and 22). If we tentatively accept Hill’s average figure for the Neolithic in Britain, we might thus suggest that the c. 300 vessels at Hurst Fen were broken by the equivalent of one household occupying that place over 55 years, or five households over a decade. Similarly, the material at Kilverstone (151 pots) equates to one household occupying that place for 25 years, or five households for five years. Even the single pit at Hall Farm Reservoir, with 12 vessels, could be equivalent to two years’ occupation. On this basis, it can certainly be argued that the link between pits and ephemeral and highly mobile occupation has perhaps been overplayed (Garrow 2010). Whatever these numbers actually imply in a quantitative sense, it is clear that many sites—all but one of which produced no evidence for any structures—did witness substantial occupation(s).

Pits as containers of significant ‘background’ information

In addition to information about specific sites, it is possible to glean a great deal about issues of broader note to the Neolithic as a whole from the contents of pits. To illustrate this point, I will focus on evidence for the cultivation of domesticated crops and gathering of wild plants, again using eastern England as a case study (see also Garrow 2010).

Over the past two decades, debate has raged as to whether cultivated cereals or gathered wild plants were the major contributor to Neolithic diet in Britain. On one side, it has been argued that a mixture of wild foods and cereals were used, but the former predominated throughout the Neolithic, whilst the latter played a more symbolic role (e.g. Richmond 1999; Thomas 1999). On the other side, it has been suggested that wild foods, particularly hazelnuts, are simply more visible due to preservation biases, and that the Neolithic economy was actually almost entirely cereal-based (e.g. Rowley-Conwy 2000). Often, these arguments have been conducted with evidence from a rather selective and unusual sample of sites: causewayed enclosures and ‘freak’ assemblages such as those from the timber structures at Lismore Fields in Derbyshire, or Balbridie in Aberdeenshire (Thomas 1999, 25). By contrast, pit sites arguably allow something approaching a ‘background’ impression of the situation at the time.

The archaeobotanical evidence from pits in eastern England strongly suggests that it is unwise to come down on either side of the wild/cultivated fence. Of the 33 early Neolithic pit sites in the region, 11

were sampled for charred plant remains. Nine of these produced wild plant remains, with hazelnut shells predominant but apple also in evidence. Seven of the 11 sites produced charred cereal remains (dominated by emmer and to a lesser extent barley). Two further sites, both excavated before flotation samples were taken routinely, produced secondary evidence for cereals in the form of seed impressions on pottery (Clark et al. 1960, 211; Wainwright 1972, 21). Broken down into individual feature-specific samples, the picture is slightly less well-balanced, but nevertheless comparable: 61 pits were sampled in total, 52 (85%) of which produced hazelnuts and 35 (57%) cereal grains.

Considering that all these sites lie on sand or gravel subsoils (leading to extremely poor preservation conditions, particularly for charred seeds), and that for a variety of reasons hazelnut shells are much more likely to be preserved in the first place (Jones 2000), it can be argued that both wild and cultivated plant foods are actually well represented. It is not my intention, however, to perpetuate debates on the relative importance of wild or domestic foods. Given the problems and biases of initial preservation and post-depositional survival, it is almost impossible to assess this effectively. What seems most important is that on 64% of all sites sampled, and on 100% of sites where more than one sample was taken, both cereals and hazelnuts were found. Clearly, on the basis of this evidence, both formed an important part of people's diets. Previous debates, which have argued for *either* wild *or* domesticated plant foods being dominant, might therefore be somewhat misplaced, in this region at least.

Material dynamics and the temporality of occupation

In this final section, I would like to illustrate the potential that material patterning across pit sites has for understanding another much-debated issue of wider significance: the permanence of settlement (e.g. Whittle 1997; Rowley-Conwy 2003). Again, I look firstly at Kilverstone, as it represents the most thorough analysis of material patterning on a pit site to date (Garrow et al. 2005). Although I will not dwell on other sites in detail here, similar analyses on a number of pit sites in eastern England produced extremely similar patterning (Garrow 2007b).

Most pits at Kilverstone were grouped into spatially discrete clusters (Fig. 38.3), with some variability in the forms these clusters took. Whilst many were relatively well-defined (pits spaced closely together, and separated from the next cluster by several metres), others were more diffuse; there were also a few 'isolated' pits which did not clearly

fall within any particular grouping. The clusters also varied considerably in the number of pits within them. Initially, clusters were defined purely through spatial proximity and were intended as an aid to interpretation, enabling finds to be analysed in relation to the layout of the site. However, it became clear that many of the pits grouped together on this basis were also connected through shared material assemblages (i.e. flint and pottery re-fits) ([Beadsmoore 2006](#); [Knight 2006](#)).

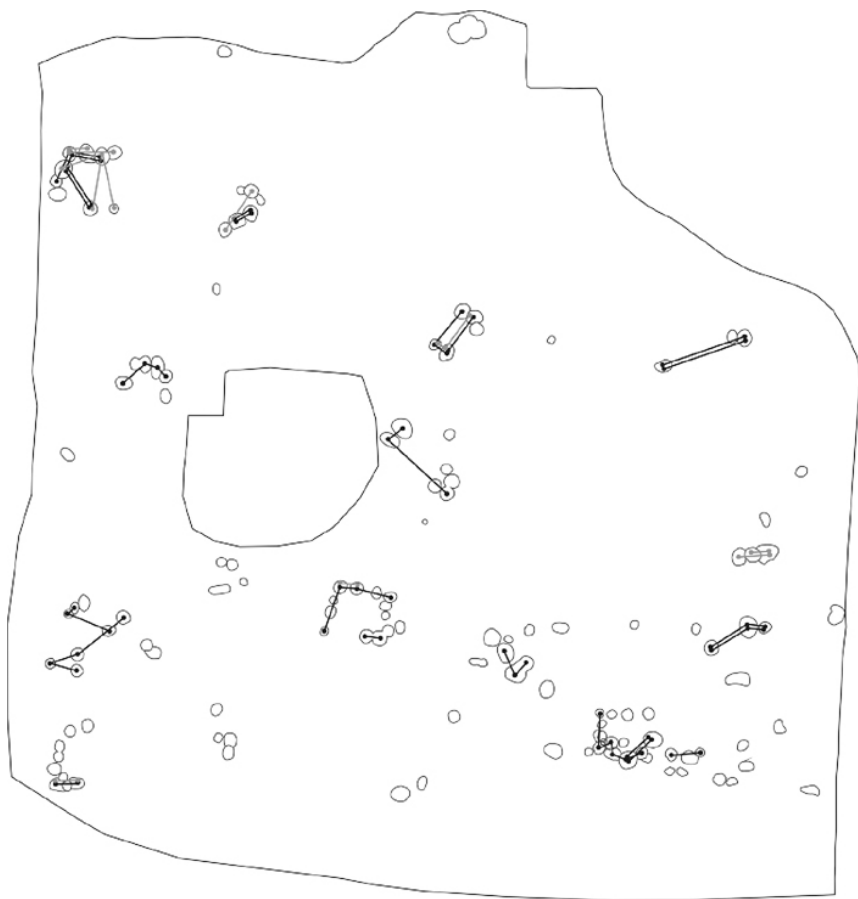


FIG. 38.3. Re-fits within Area E, Kilverstone, Norfolk—pottery in black, flint in grey ([Garrow et al. 2005](#), fig. 10).

The patterning of re-fits between pits was extremely revealing. Here, the same patterns were observed irrespective of whether pottery or flint was involved (unusually large sherd sizes ensured a very good potential to re-fit pottery). Within both assemblages, numerous re-fits were established ([Fig. 38.3](#)). Unsurprisingly, many involved pieces in the same pit. Interestingly, numerous others were found between pits in the same cluster. However, despite concerted attempts, no re-fits

within the pottery, and only a single re-fit within the flint, were established between pits in different clusters.

In summary, the processes behind deposition had ensured that parts of the same pots or of the same flint working sequences often ended up in separate pits within a cluster, but—with a single exception—never in separate clusters. These links existed within widely spaced, diffuse clusters and neatly defined, spatially discrete ones alike, and in clusters with small and with large numbers of pits. Whilst pits within spatially discrete clusters were closely linked, the different clusters were not. Ultimately, we argued that this had come about as a result of the temporality of occupation on the site: the clusters were materially separate because they were also temporally separate, produced during different occupations (Garrow et al. 2005). It proved possible to suggest a *temporal* interpretation as a result of assessing the *material* dynamics within and between the pits. Prior to this analysis, debates about settlement mobility in Neolithic Britain had been conducted largely in relation to the presence or absence of houses. As the evidence from Kilverstone shows, the absence of archaeologically visible domestic structures on a site does not necessarily mean short-term settlement there. The contents of pits, if analysed creatively, can help elucidate the character of Neolithic occupation.

SUMMARY

The fact that sites consisting only of pits exist in Britain is a relatively unusual aspect of the archaeological record. The concurrent absence of domestic dwellings across large parts of Britain has led to a situation in which archaeologists are forced to question what they mean by ‘settlement’, and to break apart the age-old links between farming/pottery on the one hand, and permanent occupation on the other. The fact that pits can be multi-faceted in terms of their original ‘uses’ has ensured that interpretations of these features have over the years been creative and fairly fluid. Recently, it has been generally accepted that pits may well have been dug purely to receive deposits, rather than having any prior ‘purpose’ as such. Arguably, this practice is the result of a changed ‘Neolithic’ attitude to the world, and between people and places.

Over the past 25 years, the concept of ‘structured deposition’ has become central to most interpretations of Neolithic pits in Britain. The notion has proven so enduring that it has been applied to many different types of site, and indeed to other periods and regions (Garrow 2012b). However, the success of the concept has, in certain ways, also been its downfall. Structured deposition has shifted from

being a means to an interpretive end to an interpretation in itself. This has effectively cut short interpretation especially of pit features. In this chapter, I have sought to demonstrate the potential of moving beyond the act of deposition itself, to look at what the material within pits can tell us about the dynamics of the lives and practices that material was caught up in prior to being deposited. As pits' uses can be varied and sometimes vague, and as these features can seem small and insignificant next to impressive monuments, they have been easy to overlook. I hope to have provided more than enough evidence as to why it is vital to incorporate these undeniably small, but nevertheless materially rich and very rewarding features into our narratives of the Neolithic in Britain and beyond.

ACKNOWLEDGEMENTS

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CHAPTER 39

ANIMALS AND SOCIAL RELATIONS*

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INTRODUCTION

THOUGH achieved through varied mechanisms and with varied material, social, and ideological outcomes, the advent of the Neolithic across Europe brought with it the creation of new worlds (Whittle 1996). Animals, both domesticated and wild, were an ever-present and central part of those social worlds and the effect of their considerable presence should not be underestimated. The control and care of certain species (principally cattle, pigs, sheep, and goats) was now exercised as an integral part of the process of making a living. Behind the zoological role call lay an intricate perceptive knowledge of the environment, folk taxonomies, and rules and routines that structured encounter and engagement with the ‘animal estate’. Whilst traditionally archaeological studies focused on understanding animals in terms of their place within subsistence practices, diet, and strategies of environmental adaptation, there is developing awareness of the social, ontological, symbolic, and cosmological status of animals during the period (e.g. Tilley 1996, 62–66; Jones 1998; Whittle 2003, chapter 4; Marciniak 2005; Pollard 2006).

The position of animals within Neolithic social worlds was likely greater than that of other components of the non-human environment such as plants, though the latter carried their own values (Fairbairn 2000). This elevated status derived from their position as sentient beings sharing many of the ontological qualities of people—comparable life-cycles and behavioural traits in some cases, affection, the display of dominance hierarchies, and differing degrees of sociality—whilst at the same time retaining clear biological and behavioural differences. Animals were woven into the fabric of social life through their ubiquitous presence and involvement in creating and maintaining social relations via their deployment as a medium of exchange, and in sacrifice and feasting. Through different kinds of engagement, they also contributed to the construction of personhood

and identity (Fowler 2004). Above all, people's relationships with animals are elegantly surmised by Morris (2000, 20) as 'complex, intimate, reciprocal, personal and crucially ambivalent'.

With such a generalizing framework in mind, this article explores aspects of the social and ontological relations between people and animals during the Neolithic, particularly cosmologies and folk classifications, and the place of animals in social relations and identity formation. Throughout, we emphasize the recursive character of these relationships, aiming to understand how the presence, qualities, materialities, and networks of animal life shaped human socialities as much as human agency created engagement with the 'animal estate'. It is impossible here to cover the full complexity of human-animal relations across the full geographic and chronological span of the European Neolithic; therefore we focus on the regions corresponding most closely with the authors' specialist knowledge, namely northern and north-western Europe.

DOMESTICATED AND NON-DOMESTICATED ANIMALS IN THE EUROPEAN NEOLITHIC

The emergence of Neolithic lifestyles was closely associated with new skills and technologies, with animal husbandry arguably one of the most crucial. Neither sheep nor goats had wild ancestors in temperate Europe (Glass 1991, 30), aDNA evidence pointing to their initial domestication, along with that of cattle and pig, in the Neolithic of the northern Near East (Bollongino and Burger 2007; Tresset and Vigne 2007). Despite the presence of wild cattle and pig across most regions, evidence of localized, indigenous domestication of ungulates in Europe is not strong. However, the possibility still exists, whilst interbreeding between domesticated cattle and aurochs can be detected in some regions (e.g. Götherström et al. 2005; Bollongino et al. 2006).

The introduction of domesticated cattle, pig, sheep, and goats is seen as marking a partial or wholesale shift from hunting as the principal mode of engagement with animals. The picture is in fact highly varied (Jarman 1972; Boyle 2006; Tresset and Vigne 2007). Whilst in the early Neolithic of Greece hunting was much reduced, among later western Impressed and Cardial Ware groups the culling of deer and wild boar retained an important role (Tresset and Vigne 2007, 194–196). A range of wild animals such as red deer, aurochs, badger, hare, and fish are very common in the early Neolithic (Körös culture) in the Carpathian Basin, whilst the role of hunting varied considerably across the different areas of the LBK (*Linearbandkeramik*,

or Linear Band Pottery culture). The number of wild animals in faunal assemblages generally appears to decline in the fifth and fourth millennia BC, wild animal remains being represented by antlers, teeth, and tusks mainly in mortuary contexts. However, wild fauna make up in excess of 40% of middle to later Neolithic assemblages from sites in south-west France, north-east Spain, southern Scandinavia, and the lower Rhine (Midgley 1992, 369–372; Boyle 2006). In fact, within any one region or cultural group there can exist considerable inter-site variation in the representation of different wild and domestic species, as shown by data from southern Scandinavian Pitted Ware and TRB (*Trichterbecherkultur*, or Funnel Beaker culture) contexts (Midgley 1992, 369–372), northern France, and southern England (Tresset and Vigne 2007).

Hunter-gatherer modes of thought can persist beyond the transition to farming, and it is perfectly possible for communities and individuals to hold different, highly context-dependent modes of thinking about the world (Barnard 2007). Where notions of metamorphosis and the immanency of sacred agencies exist, certain species of wild animal might be consciously avoided by farming communities, and their killing and consumption become matters of taboo, because they are perceived to be the embodiment of ancestors or other spirits; an equivalent to ideas of spirit presence in animals often held by hunter-gatherers. This may explain the near total disengagement with species such as brown bear, wolf, cat, and fox, as evidenced by the extreme scarcity of their remains, during the early Neolithic of southern Britain (Pollard 2004, 2006). Where hunting continues, this may even become more ritualized and hold a sacramental dimension (Morris 2000, 23), an observation evidenced by the careful and evidently respectful burial of hunted aurochs in the final Neolithic–early Bronze Age of north-western Europe (Cotton et al. 2006).

INTERPRETING THE EVIDENCE

Faunal remains from Neolithic settlement sites deliver valuable insights into various fields of discourse in which animals were involved. These comprise, in particular, social immersion of human–animal relations, food acquisition, preparation, and consumption, and refuse disposal practices. The character of faunal assemblages at Neolithic sites is shaped by a potentially complex set of cultural and natural processes, with the majority of assemblages formed as a result of continuous long-term accumulation originating from varied sets of activities and often creating a palimpsest. The other category of faunal

data comprises debris of single episodes such as feasting or so-called 'structured' deposition.

The study of faunal assemblages is the investigation of the life history of an animal, including its complex relations to humans, food-related activities, and, finally, disposal of remains. Paradoxically, the latter could have had the greatest impact on archaeologically recovered patterns (cf. [Parker Pearson 2000](#)). Hence, the social interpretation of faunal assemblages is only possible after details of their depositional and post-depositional history are revealed and quantified. More particularly, this investigation involves a detailed evaluation of a complex set of cultural and natural processes shaping the observed distribution of faunal data in particular archaeological contexts. Its first step comprises an examination of the assemblage's taphonomic history to estimate the degree of modification due to food-related practices and natural causes. This can be supplemented by a study of density-driven attrition. Common practice then involves an examination of species composition, sex and age profiles, and body part representation across distinct contexts such as pits, spaces, and houses across the site. The last step comprises a detailed study of the distribution of faunal remains in relation to other categories of archaeological data such as pottery, chipped stone, and botanical remains, as well as their distribution in distinct features. Recent developments involve lipid analyses, which reveal fatty acids indicative of animal fats stored or cooked in pottery vessels (cf. [Copley et al. 2003](#); [Craig et al. 2005](#)). Their results are, however, not straightforward when vessels had multiple uses including the heating of milk products, cooking, or meat or marrow extraction.

CLASSIFICATION AND FOLK TAXONOMIES

The diversity of living organisms is overwhelming. Humans impose order on this complicated organic world by the practice of classification, which defines and distinguishes groups or categories of organisms sharing certain similarities according to an established set of criteria, and then assigns the individual object to one such category. These are later arranged into a larger classificatory scheme in the course of the practice known as taxonomy. Any taxonomic system needs to be composed of distinctive, mutually exclusive, and unambiguous categories arranged in a hierarchical manner in the form of a tree structure. An important example is Carl Linnaeus' classification of animals and plants in the eighteenth century AD that marked the beginning of modern zoological nomenclature. Linnaeus proposed a hierarchical system in which each organism belongs to a

series of ranked taxonomic categories such as species, genus, family, order, class, division, and kingdom. He introduced the so-called binomial nomenclature system whereby each species is referred to by a two-word name in Latin, consisting of the generic name followed by the specific name.

This is only one of many taxonomies, however. Folk taxonomies vary to different degrees from the Linnaean system and Neolithic animal categorizations were probably closer to folk taxonomies than to the scientific ones. According to the ethnoscience school of folk taxonomy, the animal world is grouped into five categories: (a) unique beginner, i.e. something akin to the kingdom in biology, usually with no label; (b) a life form, i.e. an inclusive group of organisms delimited by general morphological similarity, such as size, behaviour, or habitat (e.g. fish, bird, or mammal); (c) generic form, i.e. groupings of organisms in the natural environment, comprising the most common category; (d) an intermediate form delimited on the basis of habitat and/or morphology, with less specific criteria than at the generic level, and (e) a varietal form designating categories of significant cultural importance (Berlin et al. 1973).

Contrary to modern zoological systems, folk taxonomies are usually polynomic in nature, i.e. they delimit paraphyletic taxa defined upon shared primitive characteristics, as opposed to a monophyletic taxon, often defined by one or more uniquely shared characteristics. For example, the Fore group from the East New Guinea Highlands developed an exhaustive system of classification consisting of two levels. The first comprises a higher category called 'big names' which is further subdivided into lower units called 'small names'. Among 'big names', the Fore list diverse and conspicuous animals of little economic significance including both smaller, such as rodents and marsupials, and large flightless creatures, such as echidna and giant rats. The 'small names' comprise usually economically important animals (Diamond 1966).

Early farmers' actions were certainly conditioned, at least partly, by their way of knowing, understanding, and conceptualizing their world, including domesticated animals. This was probably very idiosyncratic and inevitably far distanced from the scheme of modern biology. Accordingly, paraphrasing John Berger (1980, 5) one can argue that animals in the Neolithic 'were subjected *and* worshipped, bred *and* sacrificed'. Possibly the best example of the significance classification schemes can impose on the treatment of various animals is found in the Bible. Based on degree of holiness, it explicitly distinguished inedible and untouchable animals from those fit for consumption and sacrifice. The herds of clean animals such as cattle, sheep, and goats were blessed by God and thus part of the divine order. Special

importance is given to the lamb, a sacrificial animal par excellence. In contrast, animals such as pigs were avoided because, not being cloven-hoofed and ruminants, they failed to conform to necessary criteria of cleanliness, leading to their avoidance and food prohibition (cf. Douglas 1966).

Major domesticated animals in the European Neolithic were treated and used in a distinctively different manner, implying their different categorization. As argued by Ellen (1979), any classification is constituted within certain social conditions and can be situational or structural. The former refers to the specific not-yet-fixed social context in which classifications are in the process of formation; the latter to stabilized social and economic relations. At another level, different animals, through their position in the classification scheme, conceptually framed and constituted different parts of the landscapes they inhabited. This created an association between different species and certain parts of the landscape in the form of a relationship between place, memory, and identity (Jones 1998; Jones and Richards 2003, 49). According to Jones (1998, 303), animals provided ‘a medium by which places may be linked through social and symbolic practice’. Thus categories of animals may refer to other categories, such as categories of place.

TRACKING ANIMAL BIOGRAPHIES

By virtue of their biological lives, histories of ownership, exchange, death/slaughter, sometimes consumption, and eventual deposition, animals and their remains hold intricate biographies. In this respect they are different only by degree, if at all, from people. Many animal life-stories were probably of little consequence, and both disposal practices and taphonomic processes have removed their presence from the archaeological record (traces may, of course, be indirect, such as lipids in ceramics or rare preserved footprints: Roberts et al. 1996). Engagements with wild species offered little opportunity for the generation of specific biographies, but with domestication came the capacity to track the lives of certain animals in detail. By virtue of their special status and imbrication in human social worlds, the biographies of some animals were undoubtedly consciously cultivated and remembered by their human custodians.

To judge from the special treatment afforded them through careful deposition and even formal burial, cattle often featured highly in Neolithic social worlds. In the early and middle Neolithic of central and north-western Europe the lives of cattle perhaps mattered more than their contribution to the diet of local inhabitants suggests

(Bogucki 1988, 1993; Ray and Thomas 2003). They may have achieved this position long before domestication altered their anatomy, as documented in the Near Eastern Neolithic. Numerically dominating many faunal assemblages, cattle were an important source of mobile and inheritable wealth, of dairy products, traction and, on special occasions, of meat, probably due to qualities such as their size, strength, vitality, and mobility (Whittle et al. 1999, 385). This special treatment afforded to cattle is widely discernible across Europe and the Near East (e.g. Akkermans and Schwartz 2003, 75; Edmonds 1999, 28). Probably the best example comes from Çatalhöyük (Mellaart 1967; Hodder 1990), with bucrania placed on building walls and bull's motifs in the form of horned benches and pillars (Fig. 39.1). Cattle are also social animals, whilst the equivalent gestation period for cattle and humans surely reinforced a sense of affinity. According to Ray and Thomas (2003), cattle were a form of inalienable wealth, used in gift exchanges, as bridewealth, in procuring alliances, or in settling death payments, with slaughter and consumption only on selected occasions (notably funerals: Parker Pearson 2000). Their enchainment within a range of social practices developed connections between cattle and kinship networks, herds becoming living histories of kinship links, exchanges, genealogies, and lines of descent: cattle effectively became 'congealed lumps of social relations' (Ray and Thomas 2003, 41). Mapping these relations and the composition of herds will become increasingly possible with the application of aDNA and stable isotope analysis. Already, there is preliminary evidence that some animals slaughtered and deposited at enclosure and ceremonial sites of the fourth and third millennium BC on the Wessex chalk of southern England had been herded from different, distant geologies to the west (Hege Usborne and Mike Parker Pearson, pers. comm.).



FIG. 39.1. Cattle bucrania built into the walls of a house at Çatalhöyük, Turkey.

(Photograph: J. Pollard)

Pig is also a symbolically and socially important animal in the Neolithic and Bronze Age. This is well reported in the Chinese Neolithic where pig was ritually important and used to display individual wealth, status, and inequality, as well as playing a key role in diet (Kim 1994, 120). Its significance then decreased, reaching a low in the Iron Age (Hesse and Wapnish 1998, 126). Pigs provide plenty of meat and can be raised quickly and in numbers, making them ideal feasting animals compared to cattle, which can take up to four years to reach optimal weight (Bogucki 1993) and so are reserved for special sacrifice. The symbolic importance of sheep and goats is less evident. They were usually not taboo, but used for different sacrifices.

The Neolithic also brought changing relations with wild animals. Red deer remained the dominant animal symbol for indigenous foragers in northern Europe. In the course of the Neolithic, the distinction we make between animals classified as ‘domesticated’ or ‘wild’ starts to dissolve. Though never domesticated, herds of deer were probably managed through selective culling and seemingly deliberately introduced to Orkney, Ireland, and other regions during the Neolithic (Sharples 2000; Woodman et al. 1997). In terms of size substitution, cattle probably replaced red deer (Whittle 2003, 91), though their behaviours are quite different (Clutton-Brock 1999). Partially butchered red deer carcasses placed on the margins of late Neolithic settlements on Orkney may say much about prohibitions on

consumption resulting from their ambiguous classificatory status (Sharples 2000, 114). Earlier in the Orcadian Neolithic, in the complex of chambered cairns on the island of Rousay, cattle and disarticulated human skeletons were placed in tombs on the lower slopes, red deer and human skulls in those on higher parts of the landscape (Jones 1998). Arguably, cattle and humans form some kind of indissoluble collective, whilst the human spirit, epitomized by the skull, is associated with the ambiguous status of wild red deer (Whittle 2003).

ANIMALS AND SOCIAL IDENTITY

Economic transformations during the Neolithic are the result of a complex set of social and ideological factors, and human–animal relations and their significant changes over time cannot be reduced solely to the role of animals in subsistence economies. We must recognize the part animals played in the formation and maintenance of communal and individual identity. This involved animals' mythic dimension and ever-presence as natural symbols, as well as the part they played in routine activities, fertility, and in forming social bonds and alliances. Whether in the context of myth or routine practice, animals provided an important medium for expressing social identity.

Animals, myths, and identity

Myths provided key narrative media through which the order of the world could be explained and legitimated, and animals undoubtedly took their place within these. The case for totemic systems of social organization deriving from or supporting origin myths during the Neolithic is weak, but these have been proposed, for instance, for animal bone from Orcadian tombs (Fraser 1983). More likely myths provided a source of didactic stories, explanations for distant events, and complex metaphors illustrating kinship patterns and people's relationships with the environment.

The position of various animal species in earliest Neolithic mythologies in the Balkans and Atlantic coast has been explored by Whittle (1998, 2000). He argues that the part-human, part-fish carvings on boulders within the seventh-millennium BC Iron Gates settlement of Lepenski Vir evoked deities or ancestral beings embodied in Danube beluga. The central mythic/symbolic role of these fish at this time might mark a response to the introduction of domesticated sheep/goats and the potentially destabilizing emergence of Neolithic lifestyles (Whittle 1998, 2003, 103). Similarly, mediation

between new ways of living and thinking of at the time of transition is argued for Mané Rutual-type motifs on coastal Breton menhirs of the earlier fifth millennium BC, interpreted as representations of whales—an important component of local late Mesolithic myths and relations with the sea (Whittle 2000). The combination of representations of a sheep/goat and cow alongside a hafted axe and whale motif on the Table des Marchand/Gavrinis menhir may define an attempt to link an existing world order with the potent novelty of Neolithic materialities and practices. However such representations are interpreted, their very presence highlights how instrumental thinking about and engaging with animals was during the transition process.

Animals, routines, and identity

Routine engagement with various animal species would have helped constitute personal and group identity, either through the avoidance of ‘unclean’ or symbolically ‘dangerous’ animals as part of food taboos (Douglas 1966, Parker Pearson 2003), or through the performance of roles such as shepherding and cattle herding, where people took their identity from the animals over which they held care and responsibility. In certain regions (i.e. central and south-eastern Europe) the occupation of new territories by early farmers was accompanied by the construction of their communal identity and descent, whilst maintaining security in a new ‘frontier’ situation and unknown environment and in the conditions of social fragmentation, as evidenced by highly dispersed occupation areas. Domesticated animals, especially cattle, were arguably important social and symbolic resources in these situations, providing metaphors for group formation and communal identity. This was particularly important in the case of the LBK. Social uses of animals, mainly cattle and possibly pigs, were part of inherited tradition, brought into being in everyday practice through material objects such as houses or monuments. Cattle, often used in feasts (see below) probably also signified ties and stressed relations with living and previous generations. Whatever the precise situation, keeping livestock may result in new status differences between households and groups, new patterns of wealth transfer, and new gender inequalities (Tilley 1996, 659–662). By way of anthropological illustration, among contemporary African groups, Holden and Mace (2003) have demonstrated a correspondence between the acquisition of cattle herds and a shift from matrilineal to patrilineal or mixed descent. The need to protect herds promotes patriliney, whilst cattle as a form of inheritable wealth benefit sons more than daughters because of their role in bridewealth payments.

At a local level, animal preference could mark cultural or intra-

group identity, as illustrated for a variety of settlement contexts with marked patterning in the occurrence and distribution of the bones of different species. At the LBK site of Cuiry-lès-Chaudardes in the Aisne valley, northern France, such patterning in deposition was retained throughout the settlement's life (Hachem 2000, Whittle 2003, 73–75). More bones of wild animals were found in pits flanking small buildings than large; wild boar was more abundant in the northern part of the site, sheep in the western, and cattle in the eastern. This has been taken to suggest intra-settlement specialization—hunters, herders, and shepherds associated with different buildings—though, as Whittle (2003, 74) points out, it may also reflect age-/gender-grade residence, or communal versus routine consumption of different species. Much later, in the thirty-fourth century BC, the short-lived lake-shore settlement of Arbon-Bleiche 3, Switzerland, shows a similar level of spatial patterning (Marti-Grädel et al. 2004). Here, pig and dog bones and those of coregonid fish were more prevalent in the southern half of the site, cattle in the north. This patterning is not a product of taphonomic factors, nor does it reflect hierarchical differences in the quality of meat or the finds and architecture of the settlement. Marti-Grädel et al. (2004, 175) suggest the patterning is linked to moiety membership, perhaps based on descent, with each lineage observing particular dietary rules.

In other contexts, hunting served to reinforce identity distinctions. At the late Neolithic (Herpály) tell and flat settlement at Polgár-Csőszhalom on the Hungarian Plain, this might relate to status. Here hunted species such as aurochs and wild boar are much more frequent on the presumably 'elevated' status tell, whilst domesticates such as sheep and goat dominate the faunal assemblage from the flat site (data from Schwartz in Bartosiewicz 2005, fig. 6.5; see Raczky, this volume). In northern and north-western Europe, remains of hunted animals in Cerny and TRB (*Trichterbecherkultur*) graves point to identity formations that had more to do with a sense of ancestry than hierarchy (Midgley 2005, 125; Tresset and Vigne 2007, 202). Bangles made of wild boar tusks, necklaces of red deer canines, carnivore claws, and bird-of-prey talons were placed within Cerny graves, though contemporary enclosures and settlements show an economy relying on cattle. Tresset and Vigne (2007, 202) note how similar these grave assemblages are to late Mesolithic graves on the Breton coast, and how markedly different to earlier LBK grave goods. The teeth and claws of wild and powerful animals may here have served to send the soul or ancestral spirit to another domain in which encounters with wild animals were part of the exchange of vitality and life-force that often characterizes hunter-gatherer world views (Århem 1996).

Ceremonial consumption and identity

The social significance of animals in the Neolithic is well manifested by food-related practices, particularly feasting and ceremonial consumption. These might have integrated and differentiated local communities, contributing to both preserving and altering their social structure. In the early Neolithic, these practices are usually associated with the domestic domain, in the middle and late Neolithic with funerary contexts and ancestral traditions. Feasts can be marked by the consumption of large quantities of often unusual foods, their modes of preparation and discard, and the settings where they occurred. Large animals, especially domesticates such as cattle, were commonly valued more than smaller stock. This is discernible archaeologically by a deliberate deposition of selected anatomical parts, including skulls, in special locations. Many of these remains were probably buried following the act of conspicuous slaughter, butchering, and eating. A range of animals were involved in this kind of consumption, from cattle through pigs to sheep.

Slaughtering cattle in the early Neolithic was embedded in rich social and symbolic connotations linked to the communal sharing of meat. It was certainly an appropriate resource in feasting and provided food used during ceremonial practices. Bones of aurochs indicative of feasting were deposited in large loam pits alongside LBK longhouses, as reported from Kujavia in the North European plain. The consumption of roasted cattle marrow appears as a common and quite peculiar culinary practice. Feasting was clearly regarded as appropriate in one social context and inappropriate in another, as indicated by the deliberate deposition of the resulting bones in specific settlement locales, in particular in the open space between longhouses, in the so-called loam pits. Such deposits do not appear in other types of pits ([Marciniak 2005](#)). Their presence in loam pits, used to extract raw material for longhouse construction, may suggest that feasting was linked with house-building. This resembles practices known from the Near Eastern Neolithic.

Ritual consumption and feasting in the middle and late Neolithic is associated with deliberate depositions of animal remains in funerary and ceremonial settings. These practices are an element of the emergence of complex symbolism associated with funerary rites ([Dietler 1996](#), 103–104) and reported in numerous contexts, from TRB burial sites such as Podgaj 7A and Krusza Podlotowa 2 in Poland ([Marciniak 2008](#)), to north-central and north-west European causewayed enclosures and longbarrows ([Andersen 1997](#); [Edmonds 1999](#); [Whittle et al. 1999](#)), and British henge monuments ([Albarella and Serjeantson 2002](#); [Parker Pearson et al. 2007](#)). At causewayed

enclosures, cattle were perhaps deposited as gifts during funerary ceremonies and linked with the emergence of social bonds between participating individuals and groups (Edmonds 1999, 28). The number of bones deposited in these locations was sometimes huge, representing hundreds of animals. They were often deposited along with human remains, as at Menneville in the Aisne Valley, where three cattle bucrania commemorated the locations of earlier burials, themselves accompanied by cattle and caprovine bones (Hachem et al. 1998). The large scale of these continuously performed practices, their deliberate character, and public location highlight the centrality of animals in Neolithic ritual and ceremonial practices. Large-scale feasting at these locales is indicative of their role as important ceremonial and exchange centres (Dietler 1996, 105; Thomas 1991, 7–28). An association between cattle, feasting, and funerals is also reported in the latest Neolithic and early Bronze Age, albeit in a considerably transformed manner. The deposition of cattle bones, including skulls, in single graves and round barrows might be linked with social rivalry between groups. The success of the group was apparently measured by the number of deposited objects and possibly the number of cattle for ritual and ceremonial consumption (Hodder 1999, 38; Parker Pearson 2000).

ANIMALS AND SOCIAL LIFE: CONCLUDING COMMENTS

Animal domestication brought new notions of human–animal relations marking a shift to acquisition and control. It enabled the management of animals' reproductive and productive potential. In terms of their economic exploitation, primary products, comprising those which can be extracted only once in the lifetime of the animal, upon its death, were believed to characterize animal use in the early Neolithic. Sherratt's influential model of a 'secondary products revolution' saw a later (third-millennium BC) diversified exploitation of animals for their secondary products and applications that can be used many times through the course of their lifetime, such as milk, wool, and textile, and as providers of traction power or transport (Sherratt 1981, 1983).

Here we caution against any understanding of animals during the period that might define them simply as economic resources. Their management brought about new rhythms of life, new roles and responsibilities, new gender roles and patterns of inheritance, and new potentials for sociality and sharing. However, the presence of animals also contributed to social tensions and some final comment should be made on the potential for increased inter-group conflict brought about

by livestock keeping. Being both mobile and valuable—‘wealth-on-the-hoof’—herds of cattle and flocks of sheep almost certainly became targets for raiding. Indeed, with relatively low settlement densities in many regions, it may have been the acquisition and control over animals rather than land or other resources that was most contested. Evidence for interpersonal violence in Neolithic and Chalcolithic Europe is growing steadily (e.g. Whittle 2003, 38–39; Schulting and Wysocki 2005; Ivanova 2006), and ranges from individual instances of blunt trauma and arrow wounds to the dramatic massacre deposits of the LBK at Talheim (Wahl and König 1987). The motivations behind individual and group conflict can be highly varied and include retribution over dishonour and suspicions of witchcraft among other causes. Theft commonly invokes violent response, and animals would have been amongst the most prestigious of ‘goods’ that could be taken, invoking the most vehement of reprisals. There could be a strong link to male status and displays of prowess, acquired both through participation in livestock raids and acts of retaliation. Perhaps it is not surprising that some of the strongest evidence for interpersonal violence relates to those times and places—for instance, the developed LBK and British early Neolithic—when people and animals were aggregating at enclosures, and when both opportunities and tensions presented themselves.

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Monuments, Rock Art, and Cosmology

CHAPTER 40

CENTRAL EUROPEAN ENCLOSURES*

JÖRG PETRASCH

IN central Europe, Neolithic enclosures have been known for over a century (Woldrich 1886). Initially, they were a very rare kind of site, which was also reflected in their interpretation. However, due to the numerous excavations and intensive prospection of the last three decades, the number of enclosures has risen so dramatically that they are now regarded as a regular feature—a typical trait—of the central European Neolithic.

Enclosures are an own, very specific site category, clearly different from all other archaeological features, such as settlements or burials. Their two most salient features are their main construction material, earth—they essentially consist of ditches and banks—and the fact that they enclose a specific area. The German archaeological term *Erdwerk* (earthwork) emphasizes the first point, whereas accurate translations of the English term ‘enclosure’ (i.e. *Einhegung*, *Einfriedung*), stressing the second defining characteristic, were only rarely used in German-language literature and are no longer current today. Other expressions occasionally used in central European publications, such as *Befestigung* (fortification), *Burg* (castle), or even *Festung* (fortress), are interpretations already strongly influenced by medieval and modern analogies and should not be used as synonyms for the largely neutral terms of enclosure/*Erdwerk*.

Alongside ‘enclosure’, the term ‘ditch system’ (*Grabenanlage*) is also used, occasionally as a synonym for the exact same sites. Logically, in this terminology, monuments consisting exclusively of palisades do not count as enclosures. This is unhelpful. On the one hand, there are sites where palisades seem to have replaced ditches and surrounded habitations or empty areas outside settlements. On the other hand, most enclosures consist of a combination of ditches and palisades. Concerning fences, however, it is often ambiguous whether they can be classified as an enclosure—they are either just within or just outside this category. Yet fences have rarely been studied, a remarkable fact given the numerous large-area excavations in central Europe. Their classification must hence remain open for now.

Neolithic enclosures are not only found in central Europe, but all over the continent (cf. [Topping and Varndell 2002](#); [Burgess et al. 1988](#)). Yet nowhere are they as numerous and as diverse as here. This is probably due to several equally important reasons. In many central European regions, archaeological research traditions go back over a century. All countries now have constitutionally enshrined, regulated monument protection. Large-scale rescue excavations must be carried out in advance of gas pipeline, motorway, industrial, and residential construction, and especially also prior to open-cast lignite mining. The excavations prior to motorway construction in Hungary strikingly illustrate how quickly this kind of heritage management practice can change the character of the known archaeology. Modern prospection methods, such as aerial photography and geophysical surveys, have also significantly enlarged our knowledge base. Of the more than 200 middle-Neolithic roundels, the best-studied enclosures to date (see below), only a few would be known without these field methods ([Petrasch 2012](#)).

Further reasons for the large number of Neolithic sites in central Europe are the natural environment and its modern agricultural exploitation. In the Neolithic, especially in its early and middle phases, softly rolling landscapes with a loess substrate, covered by fertile brown and black earth, were preferentially settled. Loess is widespread in central Europe, and especially in the south can be very deep. Loess is also eminently suitable for ditch digging, as negative features are relatively stable but can nevertheless be easily excavated. Modern wine cellars, common from southern Moravia into Transylvania, clearly illustrate this. They can be several hundreds of metres long and last for centuries without additional support. Alongside earth, wood was the most important construction material for Neolithic enclosures, but stone was rarely used. This clearly differentiates central Europe from other regions, most notably the Mediterranean where, due to the different subsoils, stone was the obvious construction material and was used much more often. Stone walls are also less susceptible to erosion, stronger in the Mediterranean than north of the Alps, introducing a further preservational bias. Today, the central European loess landscapes are mostly intensively farmed. Whilst this is unfavourable for the above-ground preservation of enclosures, it actually increases the chances of recognizing them when they exist only as sub-surface features. Indeed, of the hundreds of enclosures, only few boast upstanding remains, quite in contrast to northern and north-western Europe, where the higher proportion of pasture offers substantially better preservation conditions.

Finally, the abundance and diversity of central European Neolithic

enclosures may be down to the characteristics of the culture groups in question. However, the question of whether central European Neolithic communities really built earthworks more frequently than people in other regions must remain open, given the very different state of research in different areas.

ARCHAEOLOGICAL CONTEXT

In central Europe, enclosures are known from the earliest Linearbandkeramik (LBK, c. 5500–5300 BC) onwards (Stäuble 1990). That earliest Neolithic sites are not yet known from many regions is more likely down to the state of research than to culture-historical reality. Geographical differences in absolute and relative enclosure numbers, very noticeable from the LBK onwards (Andersen 1997, fig. 178; Petrasch 1998, suppl. 6), can also be explained by research bias. From the later LBK onwards, our knowledge of enclosures (Fig. 40.1) considerably improves and is characterized by large-scale excavations, especially numerous in the Rhenanian lignite mining area. Here, there are small ditch systems without internal buildings at the edge of settlements, such as Langweiler 8 and 9. There are also large enclosures such as Köln-Lindenthal or Erkelenz-Kückhoven (Buttler and Haberey 1936; Lehmann 2004), which probably had contemporary houses inside. Findings from the middle Merzbach valley on the Aldenhoven plateau are particularly illuminating. This c. 5 km-long stretch of valley yielded several settlements ranging from single farmsteads to small clusters of houses. Overall, 10–20 buildings existed concurrently. From the thirteenth settlement phase onwards (i.e. late in the LBK), the inhabitants built an earthwork which was first located at Langweiler 9, later at Langweiler 8. These enclosures seem to have functioned as ‘central places’ for this settlement cluster, probably in the social, political, or religious sphere. Large enclosures, such as Köln-Lindenthal and Erkelenz-Kückhoven, probably fulfilled different functions in the context of a different kind of settlement structure. Here, most if not all houses of a settlement group were located at the same site and surrounded by a ditch system.

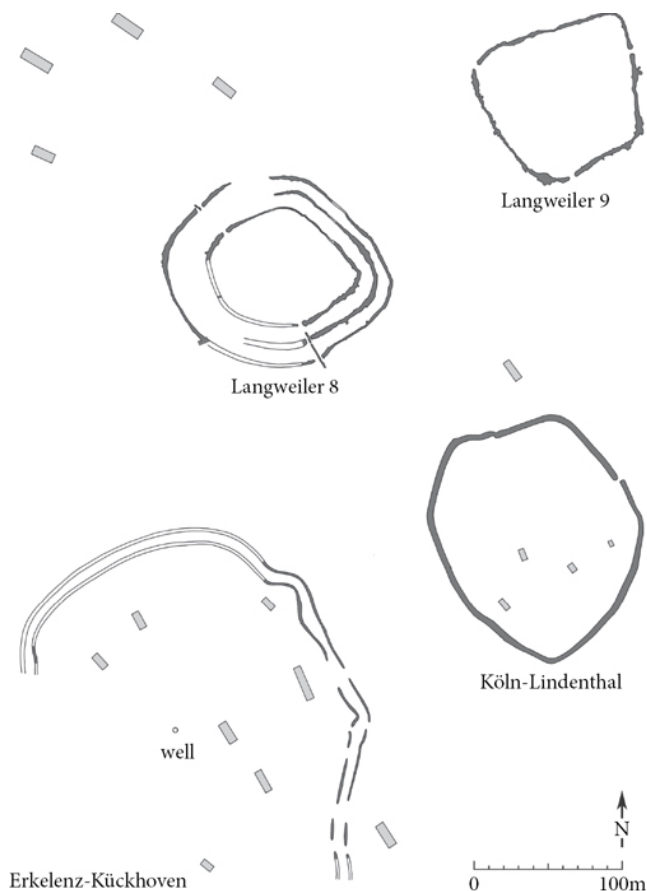


FIG. 40.1. Linearbandkeramik enclosures.

Middle Neolithic enclosures of the stroke-ornamented ceramic traditions of western central Europe and the earlier Lengyel culture along the middle Danube (4800–4600 BC) have been especially well studied. The most prominent monuments of this time are the so-called roundels (rondels) or circular ditch systems (*Kreisgrabenanlagen*) of central Europe. In the Lengyel culture, the small enclosures at the edges of LBK sites were first transformed into simple *Kreisgrabenanlagen* with a single ditch. At Svodín in south-western Slovakia, such a small monument was abandoned after a short time, perhaps only one or two generations, and replaced by a large enclosure consisting of two ditches and three palisade circuits (Němejcová-Pavůková 1995). At this time (c. 4800–4700 BC), numerous roundels were constructed in an area spanning south-western Slovakia, Lower Austria, Moravia and Bohemia, south-east Bavaria, and central Germany. After at most a century, perhaps after only two generations, no new roundels were built. Existing sites were left to decay, such as Svodín, or apparently intentionally levelled, such

as Těšetice-Kyjovice in southern Moravia (Podborský 1988). After this, in the later part of Lengyel phase I and in phase II, *Kreispalisadenanlagen* (i.e. circular palisade systems), were built instead. The direct replacement of a ditch with a palisade system is known at Künzing-Unternberg in Lower Bavaria, making this one of the most interesting sites for the interpretation of Neolithic enclosures (see below). These observations show that in the central area of roundel distribution, palisade enclosures appear to be a direct substitute in the minds of the enclosure builders. In some regions of central Europe, earthworks with a circular plan continued to be built, but these are very different from the classic *Kreisgrabenanlagen* (Barna 2007).

In the late Neolithic (Fig. 40.2; c. 4000–2900 BC), one can distinguish a northern area between the Rhine and the Elbe, with a cultural sequence of Michelsberg and Wartberg, and of Salzmünde and Walternienburg-Bernburg, and a southern area—Bavaria and Bohemia—with the cultural sequence Münchshöfen, Altheim, and Cham/Řívnáč. The Michelsberg culture yielded the two most exceptional enclosures known. The sites of Urmitz in the Neuwied basin and Wiesbaden-Schierstein (Boelicke 1976/77) are so entirely different from all other enclosures that they can with some confidence be regarded as a category of their own. Both share an interior of about 100ha, the construction with ditches and palisades, a roughly semi-circular plan, and a location directly on the Rhine. Overall, the differences from other contemporary enclosures are so large that these two sites must have had a different function and meaning for their builders. The interior of the other Michelsberg enclosures covers between 1 and 15ha (Meyer 1995; Knoche 2008), but this is too varied to form a single category. A sub-division into three size classes is possible: small sites with an interior of 1 to 3ha, such as Miel in the Rhineland; medium-sized examples (3–10ha), such as Mayen in the Eifel and Beusterburg in the Hildesheim Forest; and large sites (10–15ha), such as Salzkotten-Oberntudorf and Calden. At least two types can be defined on the basis of topographical location and ground plan: ditches cutting off promontories or river bends, such as Heilbronn-Klingenberg; and complete ditch circuits in flat areas, such as Mayen, or on the tops of gentle hills, such as Beusterburg.

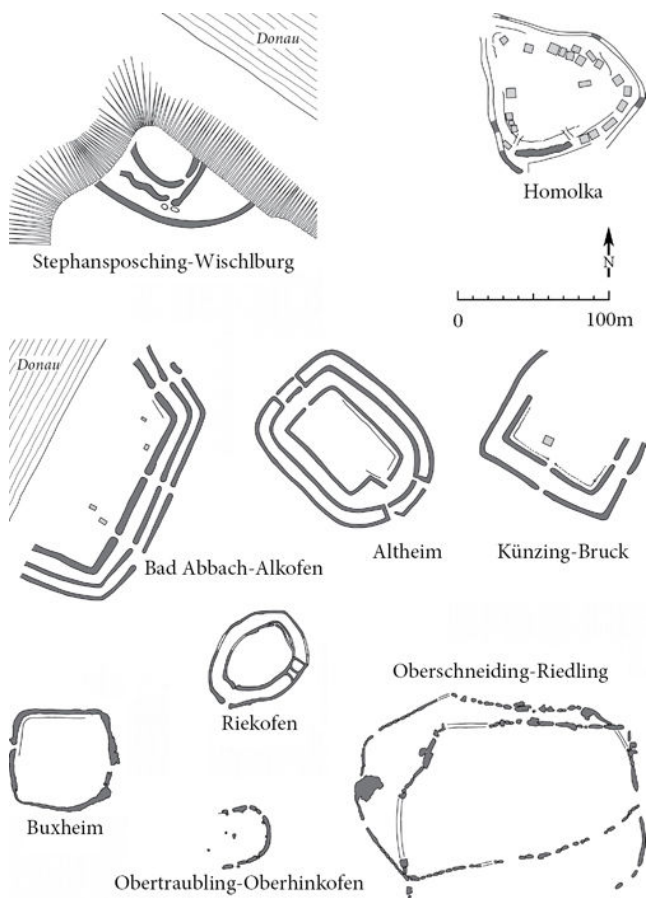


FIG. 40.2. Late Neolithic earthworks from Bavaria and Bohemia. Stephansposching-Wischlburg (Cham culture), Homolka (Řivnáč culture), Bad Abbach-Alkofen, Altheim, Künzing-Bruck (Altheim culture), Buxheim, Riekofen, Obertraubling-Oberhinkofen, Oberschneiding-Riedling (Münchshöfen culture).

In the Bavarian Münchshöfen culture, most enclosures are rectangular, or occasionally almost square, but there are also sub-circular to oval examples. Many Münchshöfen sites are known, although only few excavations large enough to recognize enclosures have been carried out. This means that the Münchshöfen culture actually ranks among the communities with the greatest density and variety of enclosures. From the succeeding Altheim group, we know mainly small rectangular earthworks enclosing c.1 ha. Within the ditch system of Bad Abbach-Alkofen in the Kelheim basin, located directly on the Danube, there were only few settlement traces consisting of a few pits and six small pit huts. The ditches of the eponymous Altheim enclosure yielded numerous arrowheads, sherds, daub fragments, and human remains, interpreted as evidence for a battle. In later phases of the late Neolithic, i.e. during the Cham and

Řívnáč cultures (c. 3300–2900 BC), relatively small earthworks were built, often on hilltops. In Homolka and Kutná Hora ‘Dänemark’ in Bohemia, the interior was investigated on a large scale and consisted of relatively closely packed rectangular houses sunk into the rocky ground. The ditches and palisade trenches were also cut into the bedrock. These places hence appear like proper hilltop settlements, planned and built for an extended period of settlement—arguments used in support of an interpretation as fortifications.

ARCHITECTURAL ELEMENTS

Alongside u-shaped ditches, v-shaped ditches are characteristic for the central European Neolithic. Occasionally, ditches were so extremely v-shaped that the narrowest parts of their bases were over a metre deep, but less than half a metre wide (Fig. 40.3). Less extreme examples grade into u-shaped profiles. With 60-70%, the relative proportion of v-shaped ditches is basically constant throughout the early and middle Neolithic. In contrast, over 90% of roundel ditches were dug as v-shapes—and very frequently as extreme v-shapes. With relative frequencies of under 5%, v-shaped ditches were essentially abandoned by the late Neolithic, and the very steep profiles of the middle Neolithic *Kreisgrabenanlagen* are now totally absent. Neolithic ditches can be between less than 1 and more than 10m wide, and they are still between 0.2 and 5.0m deep today. Given post-Neolithic erosion in the central European loess landscapes, an extra 0.5 to 1m has to be added to reveal the original depth. From the early to the middle Neolithic, average ditch depth increases slightly from 2.7 to 3.4m (Petrasch 1998, 194–195).

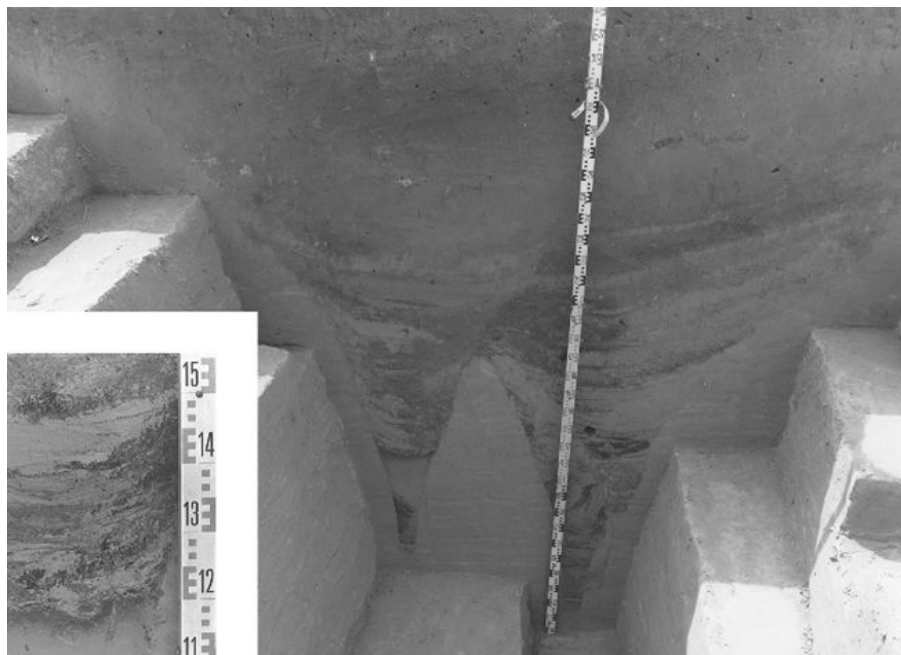


FIG. 40.3. Künzing-Unternberg. Section through the inner ditch of the middle Neolithic roundel.

Given the sometimes extreme profiles of v-shaped ditches, we must ask the question of their potential function. Clearly, a 5 to 8m wide and 3.5 to 6m deep ditch, with a pointed base 1.5m deep and less than 0.5m wide, was an insurmountable obstacle for potential attackers lacking auxiliary devices. Yet alongside a defensive function, ditches could have had a ‘symbolic’ meaning. Due to the convex profile and the dimensions of these ditches, a person stood at the edge and looking down could not see the base—the ditches appeared endless, making for an impressive construction.

The bottom fills of large v-shaped ditches are characterized by thin and very thin layers of alternately light and dark sediments ([Fig. 40.3](#)), most probably washed in after very short-term events such as heavy rainfall or thunderstorms. Mostly, there were only few finds from these lower fills. In contrast, the upper fills seem quite homogeneous, are darker, and contain more humic and clayey soils than the basal fills. Fill conditions and timescales hence varied with ditch depth. In general, finds cluster in the upper fills. Some ditches are even characterized by an unusual quantity of finds. In some cases, such as Svodín, or Kamegg and Friebritz in Lower Austria, the large and originally deep ditches yielded finds dating several centuries or even millennia after the abandonment of the earthwork, up to 1.0–1.5m below the ground surface ([Němejcová-Pavůková 1995](#)). Only

rarely did ditches, protected by pasture or woodland, remain visible above ground to the present day; examples are the Lengyel site at Falkenstein 'Schanzboden' in Lower Austria and the Michelsberg enclosure at Bonn 'Venusberg'.

The early Neolithic was characterized by ditches without accompanying palisades. There are also single palisades surrounding parts of a settlement, perhaps from the earliest LBK onwards, but definitely in the later LBK. This phase also sees the first combinations of ditches and palisades, but these are even rarer than simple ditches. Ditch-palisade combinations are characteristic of the middle Neolithic. Single palisades surrounding the large settlements of this phase, such as Inden 1 in the Rhineland, or Těšetice-Kyjovice (Podborský 1988; Petrasch 1990), are also built much more frequently now. Ditches without palisades are less frequent than before and are mostly used to enclose settlements. The combination of ditches and internal palisades remained the most common construction method in the late Neolithic and was widespread beyond central Europe. Where excavations have been extensive enough to reach site edges, most northern Alpine lake villages were surrounded by palisades. Palisade- or fence-like constructions within ditches are rare, but occur throughout the Neolithic. So far, the reconstruction of palisades is based on few and ambiguous observations. It is hence often unclear whether they consisted of single posts, perhaps connected through beams or wattling, or whether posts were placed so close together as to form a continuous barrier. All these options seem attested. Data are even thinner when it comes to where the upcast was placed. Inferences on the possible location of banks, reached on the basis of ditch fills, do not stand up to critical scrutiny, but observing features behind and in front of ditches seems more promising. Since palisades were generally built close to the ditches, banks could only have existed behind the palisades, or, in the case of multiple palisades, piled between them. So far, the findings from the Svodín roundel are the most informative. Here, a wide strip of ground along the palisades was full of lime concretions, which could only have formed if a larger amount of lime-rich loess was placed here than on either side of the strip. Also, this area yielded no Baden culture finds, which were strewn all over the remainder of the site. It thus seems that the upcast was piled between the palisades and formed a wood and earth rampart, or possibly a rammed clay wall (Němejcová-Pavúková 1995). The Michelsberg enclosure at Heilbronn-Klingenbergr near the Neckar shows yet another wall construction. In the ditches, large stones were found alongside the caved-in and burnt remains of a wooden structure, suggesting a stone-faced wooden wall with an earthen bank piled up behind (Seidel 2008). Alongside internal banks, which largely

conform to our modern expectations, external banks are being discussed for some sites. Yet most sites yielded no information on banks at all, as this evidence depends on exceptionally good preservation. It also opens the possibility that many sites had no banks close to their ditches at all, with the upcast perhaps spread inconspicuously somewhere in the surrounding area.

Mostly, enclosure entrances were simple gaps in the ditches and palisades. However, ditch terminals can also turn outwards, and in the case of sites with several ditches connections between the outer and inner ditch can be made. For ditches, entrances are between 1.5 and 4.0m wide, for palisades between 1.5 and 2.5m. These narrow entrances are characteristic from the early to the late Neolithic, and sometimes further narrowed by additional features such as long slit-shaped pits placed longitudinally along the access route. Such elements again occur throughout the Neolithic. They render the entrances so narrow that people had to walk behind each other. Postholes in entrance areas suggest an above-ground construction. They range from single posts to the left and right of the entrance to alleyways formed by outward-turning palisades, and even to veritable gate constructions (see below), particularly frequent, varied, and elaborate in the late Neolithic. At this time, a divergent concept of the fundamental enclosure-building style also gains prominence, most clearly in the Michelsberg culture and Wartberg group. Here, enclosures are characterized by multiple causeways, occasionally boasting bastion-like constructions. This is strongly reminiscent of the contemporary interrupted ditch systems and causewayed enclosures of northern and western Europe.

KÜNZING-UNTERNBERG: A CENTRAL EUROPEAN ENCLOSURE

The middle Neolithic Lower Bavarian site of Künzing-Unternberg (Fig. 40.4) has been chosen as a detailed case study of a central European earthwork to allow fuller discussion of the actual appearance of various features and the associated problems of excavation and interpretation. The site lies at the end of a low loess promontory right on the edge of the Danube floodplain. The most remarkable feature, and probably the most important for the Neolithic inhabitants, is a *Kreisgrabenanlage*. Like all Bavarian examples, it consists of two extremely v-shaped ditches. The outer and inner ditch join up at the four entrances, creating the impression of 20m-long causeways. Excavations in 1985 revealed that, with a width of up to 6m and a depth of 3.7m (Fig. 40.3), the inner ditch was considerably larger than

the 2.2m wide and 1.7m deep outer ditch. Given erosion of at least a metre in the best preserved parts of the site, a depth of roughly 5m for the inner roundel enclosure seems realistic. With these ditch dimensions and an outer diameter of 106m, Künzing-Unternberg is by far the largest Bavarian *Kreisgrabenanlage*.

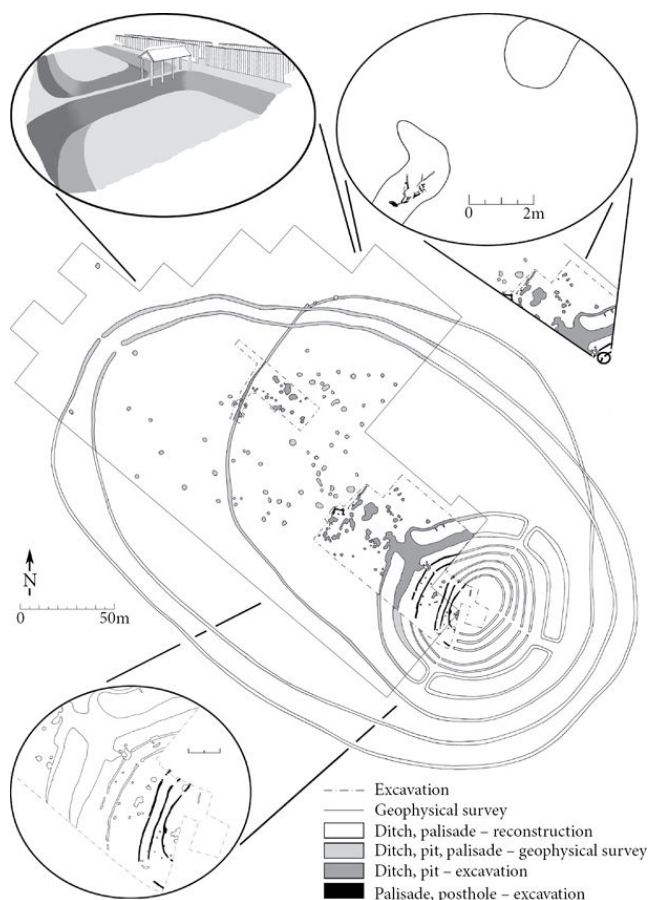


FIG. 40.4. Künzing-Unternberg.

The extremely pointed lowest parts of the ditches, especially the inner ditch, were rapidly filled in naturally through washed-in material (Fig. 40.3). If the builders of the enclosure valued this original ditch shape, they hence had to renew it, probably within one generation (25 years). The inner ditch shows three to five such renewal episodes, during which the bottom 2m of the ditch were recut. Interestingly, these repairs did not extend over the entire course of the ditch, but were carried out in sections a few metres long. These individual stretches could well have been the responsibility of different ‘work teams’, probably at least partly independent of one another. A similar system could have been in use during the initial

building of the enclosure. North of the north-western entrance, the outer ditch shows a curious bend reaching far beyond the ideal ground plan (Fig. 40.4). Given the great care with which the roundel was otherwise built, this structure seems a 'construction error', which could easily be due to two independent teams working towards one another, but is difficult to explain otherwise.

Within the roundel are two palisade rings, concentric with the ditches. This reduces the free space in the interior to a diameter of 60m, resulting in an area of 5600m². In terms of these figures, too, Künzing-Unternberg is the largest Bavarian enclosure and is surpassed by only few *Kreisgrabenanlagen* even in the Lengyel culture. At Künzing there are few features in the interior, and given the lack of finds none could be dated. Comparing the feature density and the number of finds in features within and outside the enclosure suggests that the interior was kept free. The only notable features are four slit-shaped pits, one of which was situated between the two palisade rings. All pits of this kind excavated here are from within the roundel.

The western entrance of the enclosure boasted a structure with no known parallels to date. The ditches connecting the outer and inner ditch each had three postholes in the area towards the enclosure's interior. The posts reach 1.5m below the Neolithic surface and were dug into the sloping ditch sides. Further along the axis created by these two post rows, between the inner ditch and the outer palisade, a posthole each was dug to the right and left of the entrance. It seems plausible to reconstruct these features as a gatehouse (Fig. 40.4), followed by the slit-shaped pit, oriented longitudinally towards the entrance through the outer palisade. The distances between all of these postholes could have been bridged using Neolithic technology, so that gatehouses of different lengths can be reconstructed. These could have reached from the inner connecting ditch to just before, or even right up to, the palisade. In total, the distance from the outer ditch to the empty interior was 25m. Regardless of the different possible reconstructions of the gatehouse, this entrance was hence an unusual, impressive construction. A further peculiarity is the burial of an adult male dog in the inner palisade, just south of the north-western entrance (Petrasch 2004).

The Künzing-Unternberg *Kreisgrabenanlage* was surrounded by a c. 9ha settlement, enclosed first by one ditch, later by two (Fig. 40.4). The isolated enclosure ditch was executed as an extremely v-shaped profile, just like the ditches of the roundel, but in contrast to the latter it was intentionally backfilled after a very short period of use (a few years at most, but probably less than a year). The investigated 35m stretch yielded no finds whatsoever, suggesting construction and refill at a time when no settlement rubbish had accumulated. It may hence

have been the first building episode on this site. In contrast, the outer ditches were probably dug after or in conjunction with the roundel, as their causeways align with its north-west entrance.

With the cessation of maintenance work on the v-shaped ditches, the roundel at Künzing-Unternberg was abandoned after at most a century. Instead, a circular palisade system of three concentric rings was erected in the former interior of the roundel (Fig. 40.4). With an outer diameter of 40m and an inner one of 25m, the palisade enclosure is significantly smaller than the original ditch system. Its central point and the axis through the palisade entrances towards the west are so clearly offset compared to those of the former roundel that, had both enclosures existed contemporaneously, it would have been impossible to look through the palisade rings. During the palisades' period of use, an up to 3m wide and at most 1.5m deep depression was all that remained of the former inner ditch. The changes at the north-western entrance to the enclosures are the most striking. The narrow earthen causeway, flanked by deep v-shaped ditches, was transformed into a 15m long, 10m wide, and roughly 1m deep trough. Slowly, the depression collected further sediment and settlement refuse. The sediment was exceptionally rich in humic and clayey soils, leaving the derelict ditches wetter and more densely overgrown than other parts of the site. The palisade system at Künzing can be compared with examples from central Germany and Bohemia. Taken together, they suggest that circular palisade systems were a distinct monument type which dates to the later *Stichbandkeramik* (StBK, i.e. Stroke-Ornamented Pottery, 4600–4400 BC), is only marginally younger than the *Kreisgrabenanlagen*, and has a similar geographic distribution. The transition from one monument type to the other was probably roughly contemporary throughout central Europe.

STRUCTURING THE DATA

Generally, scientific terms are unequivocally defined and clearly separated from one another. Any object belongs to only one such 'artificial' category and its superordinate classes, but never to two different classes on the same hierarchical level simultaneously. In terms of their class membership, all objects of a class are equivalent and have the same defining characteristics. In different sciences, such as biology (taxonomy) and archaeology (typology), these terminological systems proved very successful for tackling a wide range of questions. Until now, for instance, almost all archaeological work concerned with bronze artefacts has prioritized questions of

stylistic grouping, geographical distribution, and chronological classification. The methods for systematically addressing such topics, for example correspondence analysis, necessitate the unequivocal assignments provided by artificial categories.

In everyday speech, however, people classify objects totally differently. The main characteristics of 'natural' categories are their fuzzy boundaries and the non-equivalence of their members, i.e. there are more and less typical examples. Psychological experiments have shown that categories are not defined by a list of simultaneously necessary and sufficient characteristics. Every single characteristic can, but does not have to be, present in a member of the category. Hence, the 'fuzzier' allocations connected to natural categories are less suitable for addressing many traditional archaeological questions. On the other hand, using these categories in archaeology has obvious advantages for interpretations privileging the function and meaning of monuments or objects. Since this is the case in the analysis of enclosures, it is understandable that all researchers on the topic have *de facto* tried to establish natural categories through their classifications, even though this has not been explicitly discussed.

At present, the middle Neolithic roundels are probably the best-researched central European enclosures. They are hence used as an example for how 'the search for the Neolithic category' can work in practice. Researchers are and were exceptionally unanimous on what is and what is not a *Kreisgrabenanlage*, although there was no scientific discourse as such about it. In attempting to reconstruct the middle Neolithic category *Kreisgrabenanlage*, newly discovered sites were tentatively assigned to the existing group, and the resulting changes in the category—its traits and list of characteristics—were analysed. If necessary, sites were then removed again. This procedure is similar to learning a foreign language, when one is only communicating in the language to be learnt.

This study of middle Neolithic roundels yielded the so far most thoroughly argued category exclusively reconstructed from archaeological data. Analysis also determined both the geographical and temporal limits of their distribution and their contextual differentiation from other enclosures. Roundels occur in a roughly 300 by 500km region from south-east Bavaria, Bohemia, Moravia, Lower Austria, and south-west Slovakia in the south to central Germany in the north and date to a narrowly defined horizon spanning just a century and comprising the cultural groupings of middle Oberlauterbach, StBK IVa, Moravian Painted Ware I (MMK = *Moravské Malované Keramiky*), and Lengyel I. *Kreisgrabenanlagen* can be described with the following traits:

- circular or almost circular plan
- one or several, sometimes very large (v-shaped) ditches
- one or more interior palisades
- one to four generally small entrances
- settlement traces (pits, houses) outside the roundel
- the integration of the *Kreisgrabenanlage* into a complex settlement system (settlements, cemeteries, enclosures, and sometimes further roundels) within a microregion.

As expected for a natural category, not all *Kreisgrabenanlagen* have all ‘defining’ characteristics. But it is surprising how few deviations from the ideal prototype with all traits, found for instance at Künzing-Unternberg, Těšetice-Kyjovice, or Svodín, actually exist ([Petrasch 1990](#)). Overall, formally, geographically, and chronologically, roundels are an unusually clear and narrowly defined group—the best argument for them being a natural category.

INTERPRETATIVE POSSIBILITIES

Finally, I wish to give a short overview of the interpretations offered for enclosures so far. The majority of researchers assumed a defensive function, differentiating between refuge forts and fortified settlements. Cattle corrals, winter quarters for animals, and animal markets were also suggested. Other possibilities included enclosed marketplaces and high-status residences. Alongside profane interpretations, a sacred function was argued, differentiating between ritual and funerary uses. In addition, enclosures were seen as central meeting places, which could then have fulfilled economic, social, political, and ritual functions (see [Petrasch 1990](#) and references therein).

The striking differences between the different enclosures militate against a generally valid, single interpretation for all earthworks. For instance, markets and religious festivals are combined in many societies. In addition, function and meaning may change throughout a monument’s use, or new functions can be added to the original one. It hence makes sense to look for the functions of different site categories separately and to search for the original function intended by the builders. Interpretations can be subdivided into two main kinds: direct and indirect interpretations.

Direct interpretations rely on the ditches themselves. Finds from the ditches are key arguments for deducing enclosure function, as researchers hoped for direct evidence of activities within or at the enclosure. The site at Altheim (see above) is a good example for this approach. It was excavated on a large scale in 1914, but apart from a palisade following the course of the inner ditch very few internal

features were revealed. In contrast, the ditches were exceptionally finds-rich, with material apparently concentrating in the inner ditch and along the entranceways through the outer circuit. Most striking were the large number of vessels (at least 600, of which 180 could be reconstructed), 174 flint arrowheads, large amounts of daub, and the remains of at least 20 humans. On this basis, [P. Reinecke \(1915\)](#) reconstructed the enclosure as a fortified farmstead, destroyed after a fierce battle. In his direct, vivid interpretation, he went as far as to state ‘that during the struggle, even pots were thrown at the attacking enemies’ ([Reinecke 1915](#), 10). Most prehistorians followed these conclusions, but for a few the fortified character of the site did not seem sufficiently argued. They reasoned that large quantities of domestic wares, daub, and arrowheads cannot be unequivocally interpreted and that a ritual interpretation should hence not be excluded. Since this interpretation lacked supporting arguments, it was not convincing.

Anthropomorphic and zoomorphic figurines from the ditches, interpreted as sacred imagery, were used as arguments for a ritual function of enclosures ([Podborský 1988](#)). But as the builders intended the ditches as negative features, their filling up with sediment and artefacts was probably in general not deliberate. This is illustrated by the frequently attested multiple episodes of recutting. By the time the upper ditch fills, in which finds mostly concentrate, were deposited, the ditches were no longer maintained and may well have lost their primary function. Finds from these fills can hence not be used directly in support of a functional interpretation of the earthworks. Most figurines only survive as fragments, and therefore had also already lost their primary function at the time of deposition. A concentration of figurines is at most an indication that at some point, rituals took place somewhere on the site. This kind of interpretation does not relate the functions of the earthworks directly to the ditches and palisades, but seeks it in their interiors, and should thus be referred to as an indirect functional interpretation.

A further indirect interpretation sees enclosures as places at which a phase in a multi-stage burial rite was carried out. This idea goes back to research into enclosures and megalithic monuments in the British Isles, which chronologically roughly correspond to the German late Neolithic ([Raddatz 1980](#)). It is argued that corpses were first laid out in the interior to decompose. Later, single bones and possibly anatomically connected skeletal elements were collected and deposited in megaliths. New excavation results have recently made this model popular in central Europe. The ditches of the Michelsberg enclosure at Salzkotten-Oberntudorf in Westphalia revealed isolated scattered human bones with cutmarks, which can plausibly be

interpreted as the remains of multi-stage funerary rites ([Orschiedt 1998](#)).

For some years, an interpretation of enclosures, especially *Kreisgrabenanlagen*, as astronomical observatories has gained in popularity. This is based on the observation that entrances at many roundels pointed very accurately, and hence deliberately, towards prominent events of the ‘celestial year’. This begs the question of whether the significance of astronomical orientations was connected to a specific function. A function as calendar, specifically for determining particular dates, or sowing time, has been suggested ([Becker 1996](#)). In temperate areas, however, no farmer would rely on a calendar to determine sowing, but instead on the current state of vegetation. This interpretation hence appears contrived and abstract. It is a very different matter if roundels were used to determine the date of a yearly religious, political, or social event, e.g. a celebration, a gathering, or similar. Inspired by analogies from later periods, we could first and foremost suggest solstice celebrations. Indeed, the entrances of some, but by no means all, roundels are aligned on the corresponding cardinal points. Further clusters of orientations refer to marked stellar events. Thus, if *Kreisgrabenanlagen* functioned as calendars, they determined different dates. The date for an important yearly occurrence does not, however, have to fall on astronomical events, as shown by modern national holidays. Thus, entrance axes not oriented towards solar or stellar events could still be calendars. This remains impossible to prove for periods without written sources, such as the Neolithic.

If the function of roundels as calendars is so far not persuasive, but an astronomical orientation was important at least at some sites, what did the builders of these monuments connect with such events? In this context, it is illuminating to calculate the likelihood of a solar orientation for Neolithic earthworks compared to other kinds of site. The middle Neolithic *Kreisgrabenanlagen* fall between buildings and settlements for which solar orientation was insignificant and those with definite solar orientations, such as the pyramids of Giza or imperial Beijing. As the function of the latter two is known and the ‘worldview’ of at least the builders of Beijing is well recorded, they can illustrate the possible functions of astronomically aligned buildings and the reasons for such an orientation. It is revealing that neither monument had a calendrical function. The aim was rather to integrate human activity into a conceptual ‘harmonious world order’ ([Petrasch 2012](#)). In this context, the meticulous attention to the necessary orientation of burials or the capital city was only one of many important aspects. Although the pyramids of Giza and the city of Beijing were built by state-level societies, a similar aim for the

alignments of middle Neolithic roundels seems at present more likely than the comparatively contrived calendrical function. The frequently observed orientation of entrance axes towards cardinal points supports the idea that roundels were aligned astronomically due to such a symbolic 'action'. This is especially salient for the northward orientation, as no events that would make sense in a Neolithic calendar can be observed there (Petrasch 2012).

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CHAPTER 41

ITALIAN ENCLOSURES

ROBIN SKEATES

INTRODUCTION

JUST over 20 years ago, I wrote an undergraduate essay on the Neolithic enclosures of Italy. It was a fundamentally typological exercise that summarized the form, date, and distribution of these structures and their associated settlements. I found it unsatisfying because I felt unable to imagine the people who had built and used the enclosures. Since then I have attempted a more anthropological approach to the interpretation of life in central Mediterranean prehistory, drawing upon current social theory, a detailed and critical reading of the ever-expanding primary literature by Italian and foreign archaeologists, and first-hand experience of sites and museums in the region. This new essay continues that process in relation to the Italian enclosures ([Fig. 41.1](#)).



FIG. 41.1. Map of key places and regions mentioned in the text.

Archaeological research on these structures has continued for about 100 years. First excavations were undertaken in the late nineteenth and early twentieth centuries, around Siracusa in south-east Sicily by Orsi and around Matera in Basilicata by archaeologists such as Patroni, Ridola, and Rellini (e.g. [Orsi 1890](#); [Patroni 1898](#)). Aerial reconnaissance during World War II then led to Bradford's celebrated discovery of hundreds of ditched enclosures on the Foggia Plain or 'Tavoliere' in northern Puglia, and to the post-war investigation of some of these on the ground by a British team (e.g. [Bradford and Williams-Hunt 1946](#); [Jones 1987](#)). Since the mid-1960s, new discoveries and excavations of Neolithic enclosures have fairly constantly occurred throughout Italy, with highlights being Manfredini and Cassano's work on the Tavoliere in the 1970s and 80s, Camerini and Lionetti's work in Basilicata in the 1990s, and the recent large-area excavations of enclosures in northern Italy (e.g. [Bernabò-Brea et al. 2003](#); [Camerini and Lionetti 1995](#); [Cassano and Manfredini](#)

1983). New high-resolution magnetic surveys and experiments in phenomenological archaeology were also undertaken at some of the Tavoliere ditched villages (e.g. [Ciminale et al. 2007](#); [Hamilton and Whitehouse 2006](#)). However, our knowledge of the construction, use, and transformation of these sites remains limited, particularly compared to Neolithic enclosures in central and north-west Europe. This is especially due to the generally small-scale excavation at most of them, which often focused on the relative chronologies revealed by ditch stratigraphies. Published interpretations of the Italian enclosures traditionally categorized them in terms of single functions, such as defence of villages and resources, control of domestic animals, soil containment, drainage, clay extraction, and—more recently—the visible definition and division of corporate social space and identity, and of sacred space (e.g. [Barfield 2002](#); [Morter 1990](#); [Robb 2007](#); [Skeates 2005](#)).

In this chapter, my aim is to work against the grain of this tradition by emphasizing past people's dynamic and variable design, construction, use, and transformation of the enclosures and associated environmental resources, cultural materials, and activities, over space and time, in and around key places in the landscape (cf. [Skeates 2000](#)). At the heart of my narrative is an emphasis on diversity: of the built material forms of these structures, of the affordances of their environmental and cultural contexts, of the real people who lived through the enclosures, and of the purposes they served (cf. [Darvill and Thomas 2001](#)).

THE TAVOLIERE

Circular or oval enclosure ditches, sometimes strengthened by stone walls, were characteristically constructed by Neolithic communities on and around the Tavoliere Plain in northern Puglia. Indeed, it would appear that cultural tradition determined that almost all settlements were enclosed by ditches across this extensive lowland region; an exception being the apparently unenclosed cluster of ditched compounds identified from the air at the marginal site of Masseria La Lamia at the foot of the Apennines ([Jones 1987](#)). However, variability, particularly chronological, did occur in this tradition. A core data-set is provided by some 60 ditched sites investigated through field survey, magnetic survey, and excavation, whilst hundreds more have been photographed from the air.

Right from the start of the Neolithic in the relatively open Tavoliere landscape, early farming communities using Impressed Ware dug ditches around their small villages, enclosing areas of up to 4ha.

Ditches were at least 1–2m deep and between 1.6 and 3.4m wide, and usually dug into a relatively soft and easy-to-work *crusta* substrate (a conglomerate of sand, clay, pebbles, and calcareous concretions), which could have been used as building material. The completed ditches had vertical or slightly concave sides, and generally flat bases, and could have served a variety of inter-related purposes, including stock containment, defence of resources, and definition of corporate domestic space and identity. The earliest securely radiocarbon dated examples, assigned to the late seventh and early sixth millennia BC, are Masseria Giuffreda and Coppa Nevigata ([Guilaine et al. 1981](#), 156; [Hedges et al. 1989](#), 226). The sources of this cultural tradition are debatable, but at least an initial input from members of pioneer agricultural communities from across the Adriatic Sea is likely. In northern Greece, for example, a comparable tradition of settlements enclosed by ditches and walls existed throughout the Neolithic.

Ditches appear to have remained open for some time. Indeed, this was probably intended, since their inner sides were often revetted by dry-stone walling. Nevertheless, the villagers sometimes dug additional ditches, following (and occasionally intersecting) earlier ones, which sometimes resulted in multiple concentric circles of successive ditch circuits. The labour implications are considerable, both in terms of scale and organization, but we should avoid evaluating these with reference to modern economic concepts of time and energy expenditure (e.g. [Brown 1991a](#)). Community members further strengthened these boundaries by occasionally placing symbolic deposits in their bases, including human remains. For example, at Masseria Candelaro (or Valente), the relatives of a deceased adult woman dug a cavity into the inner wall of the ditch and placed her crouched body there, together with a few pottery fragments and some colourful bauxite nodules ([Salvadei and Macchiarelli 1983](#), 253–259). A somewhat less formal burial process may have taken place in the village ditch at Ripa Tetta, according to a biographical study ([Robb et al. 1991](#)). First, the complete body of an adult man was placed face-up about 35cm above the ditch base. Then, during initial decomposition, major body parts were dispersed by scavenging carnivores. Next, the bones lay disarticulated at the bottom of the ditch and were further disturbed by flooding, fire, and animals. Finally, the remaining bones were buried by natural sediments and rocks. At other sites, the outer enclosure ditches were also gradually filled with a stratified combination of cultural remains and naturally eroded deposits.

Over a much longer time-span, a few later Neolithic communities created much larger ditched enclosures. These communities produced and identified themselves with more refined, colourful, and distinct

styles of pottery, and at least some were formed by a process of settlement nucleation (Brown 1991b). Their sometimes huge enclosure ditches, up to 4m deep and 6.1m wide, delineated inhabited and more open areas of up to 28ha, and formed cumulative patterns of up to eight concentric circles. For example, four can be seen from the air at Masseria Palmori (Fig. 41.2). At Masseria Fonteviva, these multiple enclosure ditches clearly resulted from a dynamic process of growth (Trump 1987). Here, an early oval ditch was later incorporated in the eastern corner of a larger enclosure, in turn complemented by the later attachment of a third enclosure to the south-west. By the end of the Neolithic, literally hundreds of ditched villages had been constructed, reconstructed, and abandoned across the Tavoliere, extending inland from the marshy lagoons of the Adriatic coast, along the terraces of lowland watercourses, to the Apennine foothills, through long-term processes of population growth and settlement fissioning which left an indelible mark on the landscape.



FIG. 41.2. Aerial photograph of Neolithic enclosure ditches at Masseria Palmori

on the Tavoliere Plain, northern Puglia (supplied by Roberto Goffredo and reproduced with the kind permission of the Archive of the University of Foggia).

In those areas of the Tavoliere where sites have been most intensively mapped (e.g. [Cassano and Manfredini 1983](#); [Cassano et al. 1987](#); [Jones 1987](#)), enclosures clearly incorporated and transformed key places in the landscape. They enclosed the summit, scarp-edge, or foot of relatively prominent and well-drained low hills, which afforded diverse sensory connections of the wider world ([Hamilton and Whitehouse 2006](#)), and good 'ecotonal' access to diverse resource zones ([Delano-Smith 1987](#), 23). Women, children, and men would have routinely brought such resources in and out of their enclosed villages, including fresh water, raw materials for a range of structures and artefacts, cereals and legumes, domestic and wild animals, edible marine and terrestrial molluscs, fish, and birds. Aerial photographs indicate the types of entrances to these enclosures, ranging from simple gaps, to in-turned funnels, to out-turned semi-circles or 'lunettes' ([Jones 1987](#), 191–194). Although few of these entrances have been investigated on the ground, they clearly controlled the movement of people and resources, perhaps especially herds of sheep/goat and cattle. The ditched enclosures were, then, effective but permeable boundaries, connecting as well as contrasting the villagers' core routines of domestic life to surrounding cultural environments and experiences, including threats and opportunities presented by members of other enclosed communities.

Inside the Tavoliere enclosures, a range of domestic structures have been excavated. Some rectangular or trapezoidal, wooden-framed, wattle-and-daub houses were identified at sites not affected by modern deep-ploughing, such as Contrada Casone, Lagnano da Piede, Masseria Monte Aquilone, and Ripa Tetta (e.g. [Costantini and Tozzi 1987](#); [De Juliis 1972](#); [Mallory 1984–1987](#); [Manfredini 1972](#)). They are 4–4.5m long, and 3–4m wide. They were sometimes built on dry-stone wall foundations, with compacted earth floors, and occasional raised hearths of plaster. Other domestic features include extensive cobbled pavements used as multi-purpose work areas; rows of post holes; small channels; and various hollows, pits, and cavities—used as silos, wells, and cisterns, or for special deposits incorporating articulated and disarticulated human remains. Combinations of these structures were often enclosed by a small, continuous, and usually single, C-shaped ditch. These measure between 0.6 and 2.8m deep, 1–3.5m wide, and enclose spaces with a diameter of between 12 and 46m. On the Tavoliere, their openings are often oriented in approximately the same direction ([Jones 1987](#)), as at Masseria Centonze, where the 'C-ditches' are all oriented north and aligned along the long side of the oval outer enclosure ([Cassano and Manfredini 1983](#)), indicating the internal

ordering of domestic space and behaviour.

The stratified fills of these smaller C-ditches suggest that their life histories matched those of the family-based households they enclosed. Initially they were dug and kept open, their inner sides sometimes revetted or built up by stone walling, presumably during the formation and occupancy of their associated households. The remains of a few deceased individuals were sometimes inhumed in small cavities carved into the sides of ditch bases, accompanied by broken pottery and a few tools, perhaps on the death of significant household members. At Masseria Fonteviva, a domed chamber cut into the lower side of a C-ditch contained the articulated bodies of two adult women, separated by a 25 cm deposit, as well as skull fragments from a child (Denston 1987). Over time, some of these inner enclosures were remodelled in successive phases, with the fill of earlier ditches sometimes revetted by a few stones when intersected by new ditches. But in due course all C-ditches were gradually filled by naturally forming deposits containing significant quantities of food remains, artefacts, and the structural remains of houses, especially following the abandonment and collapse (perhaps even intentional destruction) of domestic structures and their associated households. At relatively small early Neolithic sites, just a few C-ditches were constructed, but many more were dug at later and larger sites. For example, more than 100 are visible from the air at the mega-site of Passo di Corvo (Bradford 1950, 86), although this represents a cumulative pattern.

The histories of some of these sites continued over an even longer time-scale, following their widespread abandonment as settlements in the fifth millennium BC, possibly triggered by a desiccation of the Tavoliere, and the establishment of a new dispersed settlement pattern in northern Puglia. Indeed, some of these places, especially their part-filled ditches, retained a historic and symbolic, even monumental, significance for final Neolithic groups still based in and around the Tavoliere, who sometimes used them for primary and secondary burial. For example, at Fontanarosa Uliveto a small stone cist containing a secondary burial was constructed on top of a filled enclosure ditch, using slabs of *crusta* extracted from the side of the former ditch (Manfredini 1987).

SOUTHERN ITALY

Enclosures formed by ditches and/or stone walls were characteristically constructed by Neolithic communities elsewhere in southern Italy (in the generally dry regions of Sicily, Calabria, Basilicata, and southern Puglia). However, variations can also be

identified here, particularly over time.

A widespread and enduring ditch-digging tradition, with close similarities to the more elaborate tradition of northern Puglia, was established particularly in southern Puglia, Basilicata, and south-east Sicily at the start of the Neolithic. Agricultural communities dug curvilinear ditches around their settlements, usually situated either on hilltops or on lower-lying river and stream terraces, cutting them into the relatively soft limestone. At least 24 such sites are known. The completed ditches generally formed single and more-or-less continuous circuits, with one or two entrances, some in the form of a 'lunette'. At Murgia Timone, a simple 4m-wide opening was flanked by a pair of post holes, presumably supporting a wooden gate, whilst a lunette was strengthened and controlled by a walled structure (Lo Porto 1998). More unusually, Murgecchia near Matera boasts two almost concentric ditches, and at Matrensa near Siracusa the enclosure seems formed by discontinuous stretches of ditch (Ridola 1926). The ditches reached depths and widths between 1 and 4m. At least some were strengthened internally by dry-stone walls. For example, at the Stentinello site of Megara Iblea (Siracusa), a regularly laid stone wall about 1.8m wide crowned both sides of the ditch (Orsi 1921). However, at Murgia Timone near Matera, in the possibly more wooded Murge uplands in Basilicata, a wooden palisade was constructed along the inner edge of the ditch (Rellini 1929). Smaller C-shaped enclosure ditches have also been identified in and around a few settlement enclosures, as at a pair of sites near Lavello in northern Basilicata (Bianco and Cipolloni-Sampò 1987, 308; Cipolloni-Sampò 1987). Traces of other interior structures and artefacts at these settlements are similar to those on the Tavoliere. The ditches were eventually filled with this cultural material, either rapidly, as at Stentinello near Siracusa, where a lack of clear stratigraphic divisions in the ditch may indicate a single filling episode (Tinè 1961), or gradually, as at Masseria Fragnano in the Murge, where the ditch contained five strata slowly deposited over the course of the later Neolithic (Venturo 1996).

At some sites, the outer ditches were strengthened symbolically by constructing special features and depositing material in their bases, which highlighted liminal connections and boundaries between communities of the living and the dead. For example, the east ditch at Serra d'Alto near Matera contained three crouched inhumations: one right in the bottom, and two in niches cut into the outer wall of the ditch (Rellini 1925). At Santa Barbara near Polignano a Mare (central Puglia), the 'Manfredi hypogeum' was dug into the inner side of a later Neolithic settlement enclosure ditch (Geniola 1987) (Fig. 41.3). It is 9m long, and has a symmetrical plan. A sloping ramp leads to two

underground chambers, linked by a short central corridor. Deer skulls were arranged along the walls of the ramp and first chamber, whilst small niches and a cross-shaped symbol were engraved in the walls of the second chamber. A small trench with human remains was found in the back room. The hypogeum also contained a stratified deposit, with animal bones dominated by roe deer, small piles of limpets, some *Spondylus* shells, fragmented jars and cups in the Serra d'Alto style, and flint, obsidian, and bone tools. The main period of use of this ritual structure was the late Neolithic, radiocarbon dated here to c. 5250–4550 BC, although sherds of Diana-Bellavista pottery indicate continued use during the final Neolithic, at roughly the same time as the formation of a new settlement just outside (and therefore in relation to) the perimeter of the later Neolithic enclosure.

FIG. 41.3. The 'Manfredi hypogeum' dug into the side of a later Neolithic enclosure ditch at Santa Barbara near Polignano a Mare, central Puglia (after [Skeates 2005](#), fig. 24).

Stone-walled settlement and household enclosures have also been discovered at some eight Neolithic settlements in southern Italy (none of which appear to have had ditches). Suggested analogies for these stone compounds are later Neolithic Aegean sites, such as Sesklo or Dimini in Greece ([La Rosa 1987](#)), although the nature and scale of any cultural influence remains unspecified. But the local significance of these structures, many added to natural boundaries in the landscape, and some with a clearly defensive dimension, should not be overlooked.

The best evidence comes from three relatively extensively excavated later Neolithic sites in southern Sicily and Calabria, all assigned to the fifth millennium BC late Stentinello culture. At Piano Vento in the Agrigento province, a 2.3–2.5m wide outer enclosure wall extended almost completely along the defensively exposed south and west slopes of the hilltop, over at least 400m ([Castellana 1986](#)). Three access passages were revealed along the excavated 50m section; the first comprises an access ramp of limestone blocks, 3m long and 1.6m wide, the other two comprise 1.8m-wide rock-cut hollows. Within the enclosure, circular and rectangular houses with stone foundations and wattle-and-daub superstructures were identified, associated with stone walled compounds, stone pavements, and clay-lined pits. Following the abandonment of this residential site, the enclosure was re-used to define the sacred space of a large final Neolithic cemetery. At Serra del Palco, north of Agrigento, a larger rectangular compound replaced an unenclosed settlement of oval huts ([La Rosa 1987](#)). Its walls were

up to 1.5m thick. The compound measured 20m long and 12m wide, and was divided in two by an interior wall. A large house, 9.5 by 6m, was repeatedly rebuilt in the larger area, whilst the smaller area could be a storage area or stock pen. Similarly, at Capo Alfiere in Calabria, a rectangular enclosure of roughly 13 by 8m contained a wattle-and-daub house with a plastered floor, surrounded by cobble paving ([Morter 1990, 1999](#)). The compound wall was formed by multiple courses of stone with some very large boulders. It was set within a foundation trench and flanked on both sides by vertical stone slabs. Material resources were brought into, ordered, transformed, and deposited within this enclosed domestic space. They included pottery vessels, stone tools (some made of imported materials), cereals and legumes, a grape, an acorn, large and smaller domestic animals, a few wild animals, birds, fish, and molluscs. These walled communities and households were thus protected from, but also constructed out of and embedded within, their wider cultural landscapes and communication networks.

A few sites in southern Puglia and Basilicata were also enclosed and sometimes sub-divided by stone walls, although the published evidence here is less clear. For example, at the earlier Neolithic settlement of Fondo Azzolini near Bisceglie (central Puglia), dated to the late seventh and early sixth millennia BC, a settlement enclosure wall, perhaps extending over a distance of 70m, runs across a slightly sloping plateau towards a large doline, the Pulo di Molfetta ([Radina 2002](#)). The wall is around 2m wide and formed by two parallel rows of large limestone slabs and a fill of smaller stones. At earlier Neolithic Trasano in Basilicata, two smaller walls, between 0.85 and 1.3m wide, divided the settlement into two sectors ([Guilaine and Cremonesi 1987](#)). This tradition of walling was also maintained into the later Neolithic, as indicated by the enclosure wall built around the three most defensively vulnerable sides of Sant'Anna near Oria in southern Puglia ([Ingravallo 1997](#)).

CENTRAL ITALY

A simplified version of the well-established south Italian ditch digging tradition also spread north, from the late sixth millennium BC, with the selective transmission of the 'Neolithic package' from south-east to central Italy via pioneer colonist farmers and indigenous groups of Mesolithic ancestry. But only around five ditched sites have been excavated, both east of the Apennines (in Abruzzo and Marche) and to the west (in Umbria and northern Lazio). Little is known about their construction and use, and whether the many other Neolithic sites in

this region were also enclosed in some way. The earliest known example is the small, discontinuous ditch at the Adriatic Impressed Ware site of San Marco near Gubbio in Umbria, dated to between the mid-sixth and mid-fifth millennia BC (Malone and Stoddart 1992). It was 1.5m wide, and a set of large ceramic containers was deposited in it. A later example is the huge ditch partly surrounding the late Neolithic settlement of Ripoli in the Vibrata Valley in northern Abruzzo (Cremonesi 1965). The ditch measured up to 4.8m deep and 7.5m wide, and incorporated the edge of the Pleistocene terrace upon which the site lay. Its size may have helped to express the social prominence of the nucleated community it enclosed, which stands out from contemporary sites in east-central Italy through its extent, its relatively high proportion of prestigious cattle, its distinctive and influential style of fine painted pottery, its import of a wide range of valuable goods, and its long duration. At various points in its history, one side of this ditch collapsed, and another section was recut to make the ditch deeper, wider, and straighter. Eventually, the ditch was filled with settlement debris. In the final Neolithic, a line of ten ditches was also cut across the middle of the ancestral site and filled with the remains of more than 45 adults and one child.

NORTHERN ITALY

Another variety of enclosures was constructed by communities, belonging to a series of hybrid colonist and indigenous cultural traditions, around large villages in the more temperate and forested environment of northern Italy. Here, some eleven enclosed sites have been excavated, both to the south of the Po Valley (in the Emilia-Romagna) and to the north-east (in Veneto, Trentino, and Friuli). How representative or exceptional these sites are in terms of north Italian Neolithic settlement forms is unclear, since they are also amongst the most extensively excavated sites in the region.

At a few early Neolithic sites in Emilia-Romagna, where potters conformed to the east-central Italian Adriatic Impressed Ware style, villagers followed the southern tradition of ditched enclosures, although they more often incorporated and modified natural ditches as part of these. This is particularly clear at Fornacce Cappuccini near Faenza, where archaeologists uncovered a 680m-long semi-circular section of a wide ditch surrounding an extensive settlement (Antoniazzi et al. 1987). Here, the ditch-diggers joined, straightened, and widened sections of a pre-existing natural channel eroded into alluvial deposits. During the early and middle Neolithic, this structure was then gradually filled with domestic debris from adjacent living

areas.

But large wooden palisades, combined with ditches and/or earth walls, were more commonly constructed by villagers belonging to the more northern-oriented early Neolithic Fiorano Culture in Emilia-Romagna and to successive cultural traditions. For example, at the vast Squared-Mouthed Pottery Culture (VBQ) settlement of La Vela near Trento, dated to the fifth millennium BC, the middle Neolithic community strengthened the pre-existing early Neolithic enclosure ditch by inserting large vertical wooden elements into it and packing large stones around their bases (Degasperi et al. 2006). At the Fiorano Culture site of Lugo di Romagna, dated to the second half of the fifth millennium BC, the villagers used all three elements to delimit their settlement (Degasperi et al. 1996) (Fig. 41.4). A slightly curving 20m section of a large palisade was uncovered here, formed by 3m long and 0.6m wide planks of longitudinally split oak set vertically, one against the other, into a foundation trench packed with clay. This trench also contained the anatomically connected right foot of a dog, covered by a decorated ceramic jug, interpreted as evidence of a foundation rite. Four metres outside this, regularly spaced post holes may indicate a wall of wood and earth. Beyond this, a series of intersecting elongated pits formed a small ditch, 1m wide and 0.6m deep, whose contents may have been used to construct the wall. By contrast, at the VBQ settlement of La Razza di Campegine near Reggio Emilia the enclosure was formed exclusively by a wooden palisade (Bernabò-Brea et al. 2003). One side of this measures just over 300m long, and comprises 215 largely equidistant cylindrical post holes. The grand human scale of these palisaded enclosures, including their environmental impact, their laborious construction, their monumental final form, and—in the case of Lugo di Romagna—its spectacular destruction by fire, should therefore not be underestimated.

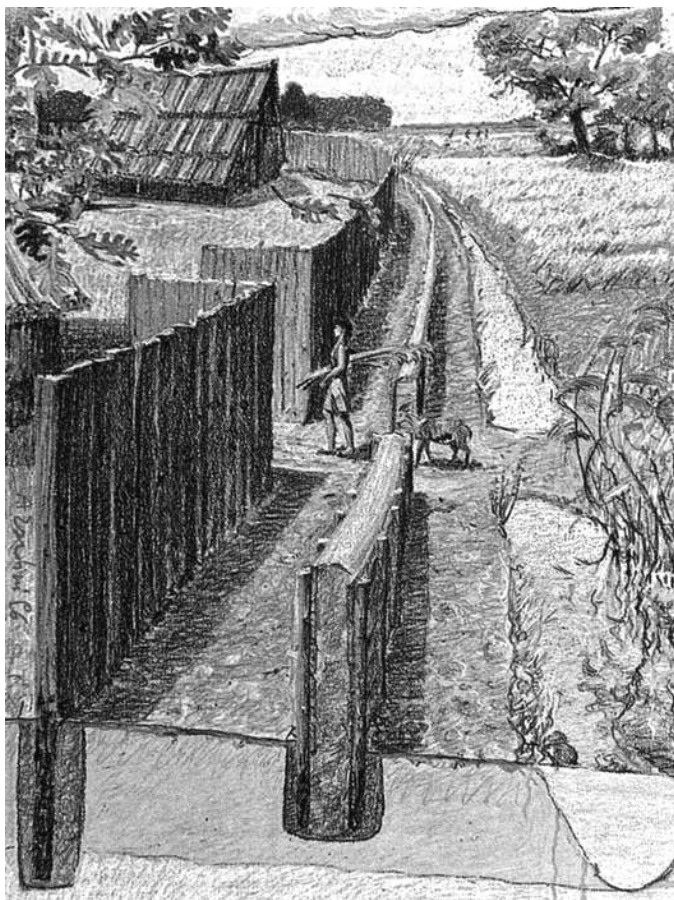


FIG. 41.4. Reconstruction drawing of an enclosure, formed by a palisade, wall and ditch, at Lugo di Romagna near Ravenna, Emilia-Romagna (after [Degasperi et al. 1996](#)).

The north Italian enclosures drew, then, a bold line around the living areas and domestic life of well-established communities. Inside, settlement features include numerous pits, some ditches, shallow channels, and post holes, rare human burials, and a few rectangular wattle-and-daub houses. At Lugo di Romagna internal structures included a two-roomed rectangular house, measuring 10 by 7m, with a timber frame and wattle-and-daub walls ([Degasperi et al. 1996](#)). At some sites, occasional smaller internal enclosures have also been defined, in the form of palisades set in foundation trenches or, in one case, a cobble-and-clay wall. For example, at the later Neolithic VBQ settlement of Monte Rocca near Rivoli di Verona, an interrupted ditch alignment, running for 22m across the middle of the site, has been interpreted as the foundations for a palisade effectively dividing the settlement in two equal halves ([Barfield 2002](#)).

All these enclosures comprised permeable boundaries, crossed by

people and their resources. For example, a series of 2m-wide entrances were identified at the palisade at La Razza di Campegine. At the Fiorano Culture settlement of Lugo di Grezzana near Verona, symbolic attention was drawn to the significance of an entrance by depositing a rare fragment of the foot of a ceramic anthropomorphic figurine in a post hole flanking a gap in the palisade (Cavulli and Pedrotti 2001). Passing in and out these key access points, members of the bounded communities maintained a two-way flow of essential resources between their inner living areas and the wider world to which they were connected. The enclosures and their entrances channelled this flow in a regulated manner, at the same time constraining the movement of people and information.

CONCLUSION

In Neolithic Italy, enclosures were intimately related to the domestic practices, cultural traditions, and long-term histories of settled agricultural communities and their constituent households. The origins of this practice, found mainly in the eastern regions of peninsular Italy and Sicily, can ultimately be traced to the Balkans, and contrasted with the more ceremonial use of uninhabited monumental enclosures in central and north-west Europe. This tradition determined that almost all settlements were enclosed on the Tavoliere, right from the start of the Neolithic, and then again and again in a dynamic process of construction, reconstruction, and abandonment, until the underlying principle of nucleated settlement eventually became obsolete. But here and elsewhere in Italy laborious acts of enclosure were also selective, mobilized as part of local strategies of spatial ordering, defence, and differentiation. Ditches were the most widespread construction, but varied locally over space and time, whilst regional variations in culture and environment afforded the greater use of stone walls in the relatively open landscape of the south and the erection of wooden palisades and earth walls in the north. Local topographic features, ranging from water channels to scarp-edges, were sometimes incorporated into the enclosures, as were special deposits highlighting their liminality and history. These physically and symbolically significant structures moulded the lives, experiences, and perceptions of the variety of people—differentiated by age, gender, household, and community—who permeated their boundaries to communicate with the wider world and to return home to the places where they belonged.

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CHAPTER 42

CAUSEWAYED ENCLOSURES IN NORTHERN AND WESTERN EUROPE

NIELS H. ANDERSEN

INTRODUCTION

CAUSEWAYED enclosures, also referred to as causewayed camps, *Erdanlagen*, *enceintes interrompues*, and *Sarupanlæg*, are one of the most widely distributed types of Neolithic monument, dating from the second half of the fifth millennium and the fourth millennium BC. They are characterized by a system of ditches or segmented ditches which, like oblong pearls on a string, enclose areas of up to several hectares. One or more palisade trenches, located concentric with or parallel to the ditches and banks (and also often segmented), are also occasionally found. Causewayed enclosures are typical of the Chasséen, Matignon, Peu-Richard, and Noyen cultures of northern France and adjacent countries (from the late fifth millennium), the Michelsberg culture of western Germany and eastern France (late fifth and beginning fourth millennium BC), the Windmill Hill culture of southern England (first part of the fourth millennium BC), the Wartberg culture of central eastern Germany (the middle of the fourth millennium BC), and the Funnel Beaker culture of the north European plain (the second part of the fourth millennium BC).

The first example of a causewayed enclosure in western and northern Europe was discovered in 1882, when Baron Eschasseriaux found the Peu-Richard enclosure in western France (Joussaume and Marsac 1977, 21). Two years later, the name-giving enclosure at the hill of Michelsberg near Bruchsal-Untergrombach in Germany was found, followed in 1908 by the first site—Knap Hill—in England. Here Cunnington observed that causeways divided up the ditches into a series of segments. In the late 1920s the English amateur archaeologist Alexander Keiller undertook intensive excavations at Windmill Hill (Smith 1965; Whittle et al. 1999), identifying many of the key aspects of causewayed enclosures, and in 1971 the first Scandinavian enclosure was found at Sarup in Denmark. About one thousand sites

are now known—from southern Portugal to Sweden and from western Ireland to Poland (Fig. 42.1; cf. Andersen 1997; Darvill and Thomas 2001; Oswald et al. 2001; Jeunesse and Seidel 2010; Müller 2010; Márquez-Romero and Jiménez-Jáimez 2013)—many discovered by aerial reconnaissance (Braasch 2010). Neolithic enclosures with segmented ditches are also found elsewhere in Europe, for example on the Foggia plain in Italy (Skeates, this volume, ch. 41), and early examples are known from the Linearbandkeramik culture of the sixth millennium BC (Petrasch, this volume; see also Andersen 1997, 172–179). In coming years we can expect many new discoveries, their current distribution being largely accidental.



FIG. 42.1. Extent of late fifth millennium and fourth millennium BC enclosure distribution.

The character of these sites has been debated for decades (Thomas 1991, 33), but the past 25 years have given us better excavation methods, coupled with several large-scale excavations, an improved

chronological framework, and, in some areas, intensive studies of contemporary settlements. Within the past decade many key sites have been published. This paper cannot possibly provide a synthesis of all this evidence, but it can offer a selection to demonstrate key characteristics. The most recent excavations and publications from north-west Europe will be relied upon.

ENCLOSURE LAYOUT

Their shape was governed by an aim to enclose, or ‘wrap’, a particular area. They can be entirely enclosed by earthworks or instead be formed with the aid of steep slopes, watercourses, and/or post-built fences. Through a combination of such elements, enclosures could assume the form of a circle, an oval, a spiral, a triangle, a large D-shape, or a keyhole (Fig. 42.2). They seem to have been laid out according to a definite strategy, often resulting in a ground plan which, to our eyes, was not the most practical, such as on a promontory where the ditches do not run across the shortest distance between two slopes (e.g. the northern part of Sarup I in Denmark, Fig. 42.2j). Sites can be on or close to the highest point in the landscape, or conversely, so low they must have flooded for part of the year, as at Etton, England (Pryor 1998, 351). Many sites are located on slopes with a gradient of 5–10%. These are always completely enclosed by ditches and normally do not incorporate the highest point (Fig. 42.2d). An enclosure sited on sloping ground could be more visible, but Neolithic landscapes were often covered with trees. At some sites, for example Bury Hill in England (Bedwin et al. 1981, 76, 85), shade-seeking snails were found in the ditches, indicating surrounding dense forest. We cannot therefore be sure that enclosures could be seen from a great distance. Some sites incorporate or are located by watercourses, but others are located away from drinking water, for instance Robin Hood’s Ball, England, which was some 4km from the nearest source (Barker and Webley 1978, 172).



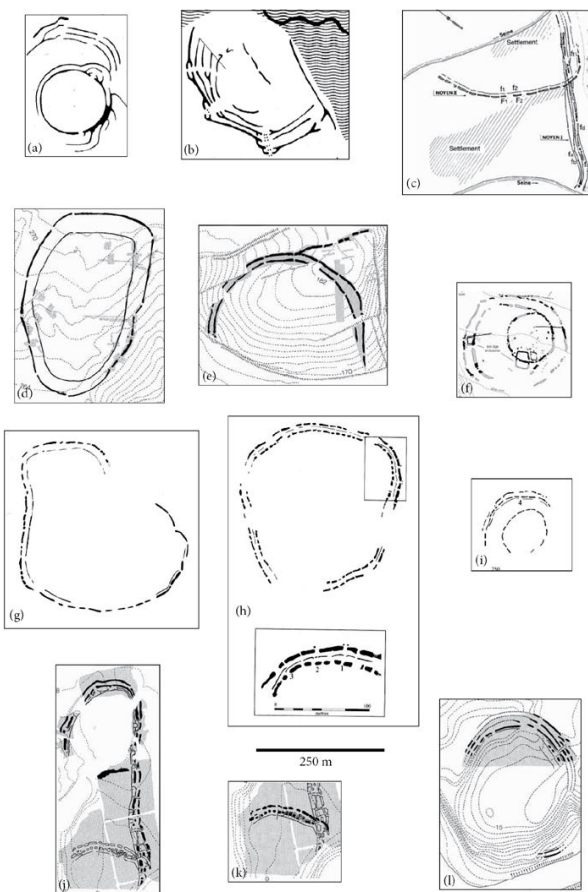


FIG. 42.2. Selected causewayed enclosures: A. Chez Reine, Matignon and Peu-Richardien culture, France (after [Burnez 1993](#), 74); B. La Coterelle, Matignon and Peu-Richardien culture, France (after [Cassen and Boujot 1990](#), 457); C. Noyen I and II, Noyen culture, France (after [Mordant and Mordant 1988](#), 236, fig. 13.3); D. Mayen, Michelsberg culture, Germany (after [Eckert 1990](#), abb. 3); E. Bruchsal-Aue, Michelsberg culture, Germany (after [Behrends 1994](#), abb. 15); F. Briar Hill, Windmill Hill culture, England (after [Bamford 1985](#), fig. 42.2); G. Haddenham, Windmill Hill culture, England (after [Evans and Hodder 2006](#), fig. 5.49A); H. Freston, Windmill Hill culture, England (after [Evans and Hodder 2006](#), fig. 5.49B); I. Orsett, Windmill Hill culture, England (after [Evans and Hodder 2006](#), fig. 5.49E); J. Sarup I, Funnel Beaker culture (TRB-North), Denmark (after [Andersen 1997](#), fig. 284f); K. Sarup II, Funnel Beaker culture (TRB-North), Denmark (after [Andersen 1997](#), fig. 284g); L. Büdelsdorf, Funnel Beaker culture (TRB-North), Germany (after [Andersen 1997](#), fig. 284g).

In a number of areas enclosures are spaced regularly and some researchers have tried to create territories to demonstrate their function as higher order sites in a settlement hierarchy ([Renfrew 1983](#), 132). Elsewhere, sites occur close together: La Chasse and Chez Reine in France lie only 0.8km apart; Sarup I and Sarup Gamle Skole

XII are only 0.5 km from each other (Andersen 2008, fig. 5); and at Niedersiecke, a little south of Braunschweig in Germany, three sites are located only c. 70m apart (Geschwinde and Raetzel-Fabian 2009, abb. 84). Of course, we cannot be sure they were in use at the same time, but the people who used them must have known of each other's existence. Burial mounds, such as longbarrows or megalithic graves, are often located close by (Andersen 1997, 282; 2011). Normally, it seems as if enclosures were placed 5km from one another (Mordant 1992, 77; Boas 2001, 8).

Whilst everywhere the intention was to enclose an area with *system-ditches*—a term which, unlike 'segmented ditches', stresses that the ditches are separate units within a system and not one long ditch broken by causeways—there were nonetheless regional differences. In England, we often find sites with shorter ditches all the way round, often joined by even smaller ones, as at Windmill Hill (Whittle et al. 1999, fig. 22). In western France we find the same, but also with a 'crab's claw' placed outside a break in the row of ditches (Fig. 42.2b) (Joussaume 1988, fig. 16.10–16.12). In Germany many shorter ditches are often united into larger segments and placed in up to five concentric rows (Günther 1991, 19).

The form of the ditches can vary greatly. Normally they were originally about 1m deep, 2–4m wide, and 5–7m long, but some are only 0.16m deep, whilst others reach more than 2m in depth. Through re-cutting, ditches can be united into longer sections (Andersen 1997, fig. 46; Mercer and Healy 2008, 54); a ditch produced in this way will often have an irregular outline and careful excavation can distinguish its individual phases (Fig. 42.3) (Andersen 1997, 46, fig. 46; Evans and Hodder 2006, fig. 5.40). As a rule, the base of the ditch is horizontal, flat, and about 1m wide. However, those of the Kleiner Heldenberg enclosure in Germany have a flat but sloping base (Heege et al. 1990, abb. 3), and at Hambledon Hill, in England, the Main Enclosure has the same (Mercer and Healy 2008, fig. 3.25). At several sites the ditches have pits, specially dug shafts, or platforms along their bottoms which may be associated with special finds like chisels, axes, deliberately fragmented pottery, animal bones, and inhumations (Andersen 1997, 284; see below). Platforms were found at Sarup I (Andersen 1997, 44, fig. 44), and at Haddenham and Briar Hill in England, where an axe fragment and cremated human bone respectively were placed on top (Bamford 1980, 363; Evans and Hodder 2006, 253–255).

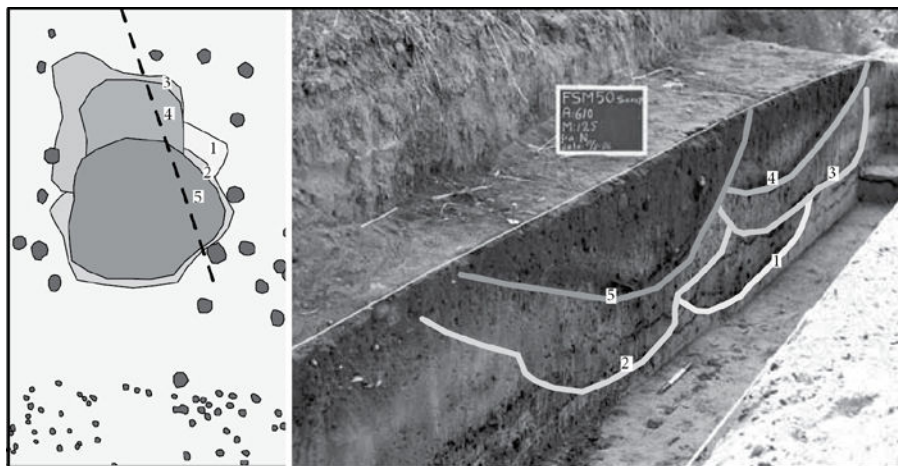


FIG. 42.3. Re-cutting of ditch A610, Sarup II, Denmark. All the re-cuts were within a fenced enclosure of large posts.

Often, artefacts left on the base of ditches were covered rapidly, but in some cases ditches remained open for a while, providing an opportunity for woodland snails to accumulate or for small bushes to grow, as at Etton (Pryor 1998, 127). Stone-set hearths and fireplaces, along with associated activities, were often located here. Human skulls have been found among their stone spreads, as at Graven in northern France (Tarrête 1983, 224), and at Motagan I, also in France, human bones were covered by a slab (Boujot et al. 1985, 7). Elsewhere, there are large stones, and at Sarup Gamle Skole XII a very small dolmen typical of the Funnel Beaker culture was found, with an inner chamber measuring 1.1m by 0.7m. About a third of a funnel beaker had been deliberately broken into 148 pieces, each about 2cm by 3cm, and placed in front of the dolmen (Andersen 2000, 27, 54).

It is uncertain for how long ditches remained open and accessible. In some the lowest 10 to 20cm could be filled with a layer of fine-grained silt blown or washed in from the side walls. It could accumulate in just a few days (Andersen 1997, fig. 49), and during excavations at Sarup, strong wind or heavy rain produced such a layer in only a few hours. Heavy rain at the German site of Klingenberg gave the same results (Seidel 2008, abb. 176). Of the 80 or so ditch segments at Sarup only one profile has these rapidly formed layers, all the others being without silt! These ditches must either have been rapidly backfilled after their original cutting or the silt was removed before refilling. The same can be said of many other sites, like Diesknöll in northern Germany (Müller 2010, 256) or the enclosures of the German Braunschweiger region (Geschwinde and Raetzels-Fabian 2009, 245). Elsewhere, ditches seem to have been left open, as at Etton, where shrubs grew (Pryor 1998, 356).

Above the bottom or primary fill of the ditches there are often layers from systematic backfilling, as if the earth had been thrown in from both sides, a process whereby cultural remains could be incorporated into the ditch. Afterwards ditches were often re-cut. This was usually confined to the original outline of the ditch, but as mentioned, it could join together pairs of ditches into one larger feature (Whittle et al. 1999, fig. 33). Traces of re-cutting have been observed at nearly all sites, and must be regarded as an important and recurrent activity. It often occurred three to four times in each ditch and at Etton up to eight re-cutting events were observed (Pryor 1998, 352). Some re-cutting took place hundreds of years after the original digging of the ditch, with activity confined precisely to the outline of the former ditch (Andersen 1997, 326, n. 127; Raetzel-Fabian 2000, 66, Tafel 41 and 23; Wincenz 1994). Memory of the ditches and the activities within them was very long-lived! The detailed excavations and post-excavation analysis at Windmill Hill revealed a style or grammar dictating how depositions took place within the lifetime of a single ditch (Whittle et al. 1999, 368). That ditches were a place for continued cutting and refilling could recall work in the fields where the ard is drawing the furrow, followed by deliberately placing the seed corn and covering it again (Geschwinde and Raetzel-Fabian 2009, 245).

Banks have been identified at some sites. At Windmill Hill and Knap Hill, England, there are still slight rises on the inner side of the ditches (Oswald 2001, fig. 5.29; Smith 1965, 5–7; Whittle et al. 1999, 73ff), and at the early Funnel Beaker site of Beusterburg in northern Germany, banks are located on both the outer and the inner side of the ditches (Tackenberg 1951). On the other hand, some sites, like Sarup I and II (Fig. 42.4), do not have enough room for large banks along the ditches due to the presence of fenced enclosures. At the English site of Crickley Hill the banks look more like platforms placed inside the ditches (Dixon 1988, fig. 4.4). Calculations of spoil from ditches always indicate the availability of material for only a small bank or heaps of soil (Andersen 1997, 51; Mercer and Healy 2008, fig. 11.1), and the desire to see enclosures as fortifications is not supported by the existence of substantial enough earthworks. Burials were found in one of the banks at Catenoy in France (Blanchet and Martinez 1988, 157).

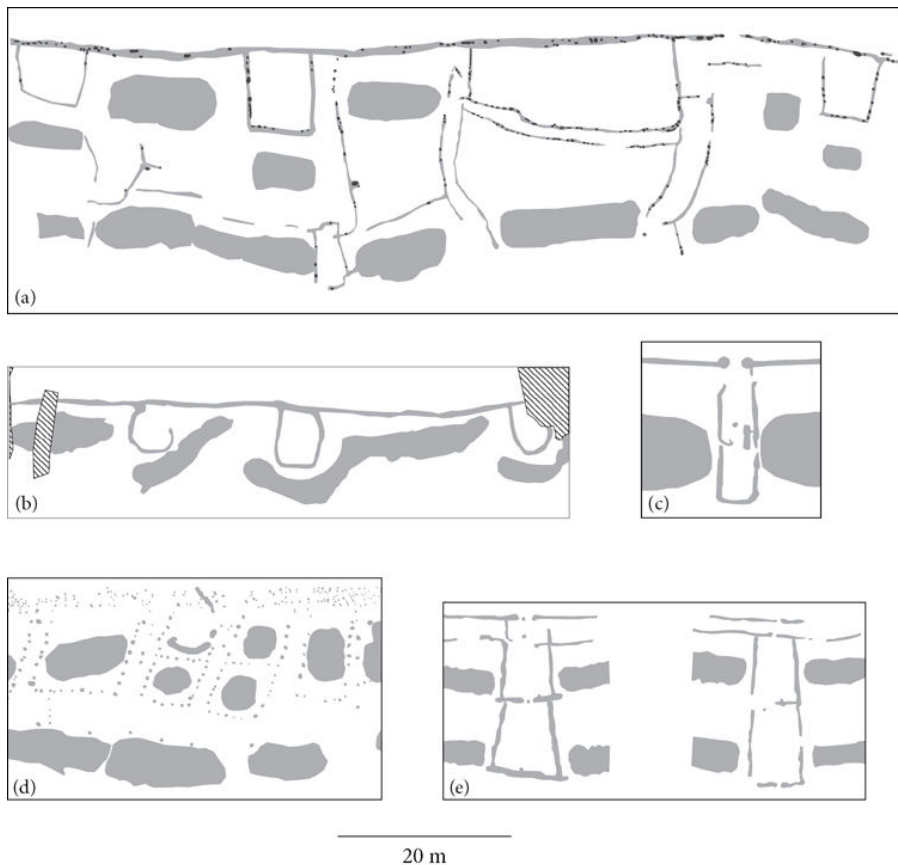


FIG. 42.4. Fenced enclosures close to palisades: A. Sarup I, Funnel Beaker culture (TRB-North), Denmark (after [Andersen 1997](#), 35–37); B. Langelandsvej-Starup, Funnel Beaker culture (TRB-North), Denmark (after [Witte 2009](#)); C. Urmitz, Michelsberg culture, Germany (after [Lehner 1910](#), abb. 6); D. Sarup II, Funnel Beaker culture (TRB-North), Denmark (after [Andersen 1997](#), 66–67); E. Calden Enclosures 5 and 2, Wartberg culture, Germany (after [Raetzl-Fabian 2000](#), abb. 12).

Many sites have palisades, and sometimes this was the main structure that the other features referenced ([Dubouloz et al. 1989](#), 22). In general, palisades vary greatly, consisting of either postholes about 1m apart (e.g. [Catenoy, Blanchet et al. 1984](#), 182), posts placed in a trench around 1m wide and 1m deep (e.g. Sarup I), or closely-spaced rows of small posts (e.g. [Sarup II, Andersen 1997](#), figs. 29 and 77). Some sites have cross-cutting palisades, others have parallel rows laid out in such a way that they must be contemporary, as at Bazoches in France ([Dubouloz et al. 1997](#), fig. 42.2) and the northern part of Sarup I ([Andersen 1997](#), fig. 36c). The deepest trenches were found at Catenoy, extending down to 2.2m ([Blanchet et al. 1984](#), 182), but most are about 1m deep. At some sites, small hollows were made in

their bases which could result from posts of different length being given a level upper edge. We must reckon on posts two or three times the depth of the trench, so between 2–6m high. To construct the palisade at Sarup I about 1,300 posts, each 5m long, were brought to the site, with a total weight of more than 400 tons. Few axes were found on site, suggesting the posts were manufactured elsewhere, and their absence would also account for the levelling of the palisade by digging deeper postholes. Here the palisade remained vertically intact for only a very short period and the remains of rotten posts and sloping postholes indicate they were not removed from the trenches (Andersen 1997, fig. 24, 320, n. 9).

Palisade trenches also contained interesting finds, such as pottery and human bone (see below). In fact, concentrations of finds could be much higher here than in the system-ditches. At Sarup I, only 20% of the palisade trench was excavated, producing a total of 2,261 finds. Of these, 85% were ceramics, representing 278 pots, with sherds from 14 pots in one cluster (Andersen 1997, fig. 60). At Noyen I (Tarrête 1983, fig. 21) and Sarup I (Andersen 1997, fig. 266), objects had originally been placed against the palisade's outer face, whilst the inner face was emphasized elsewhere, as at the Michelsberg site of Thieusies in Belgium, where 6,400 pieces of flint per m² were found (Vermeersch and Walter, 1980, 10). Palisades were clearly an important element of these sites.

The causeways are the areas left un-dug across the system-ditches. Their width can vary from a few centimetres up to 20m. Sometimes they were removed by re-cutting. Pits and trenches were dug into some causeways, as at Noyen II, where a pit contained the remains of a child and associated objects (Mordant and Mordant 1978, 561–565). Irrespective of whether there were post-built gateways or not, the causeways could have represented entrance corridors leading to the interior, especially at multi-circuit sites like Oberntudorf, Germany (Günther 1991, 19), where they were placed in front of each other.

Fenced enclosures have been located at some of the sites of the Michelsberg, Wartberg, Windmill Hill, and Funnel Beaker cultures (Andersen 1997, 292–293). These were square, rectangular, rhomboid, or trapezoid and varied in size from 2.8m by 2.8m to 10m by 20m. Often they were constructed outside the palisade, or frequently on a causeway (Fig. 42.4), but at the Irish site of Magheraboy the fenced enclosure was inside the palisade (Danaher 2007, 104–107). Fenced enclosures could be constructed of separate posts (Fig. 42.4d) or posts placed in a trench. Where an entrance was found, the opening was towards the inside of the site (Fig. 42.4d and e). Trenches for fences were often shallower than those for the palisade. At Sarup I they are presumed to have had a height of 1.5m,

about half that of the palisade (Andersen 1997, 292). At Sarup II (Fig. 42.4d) and Büdelsdorf (northern Germany) (Fig. 42.2l) ditches were located inside enclosures (Andersen 1997, figs 80 and 286). There is little information about the function of the enclosures, but the location of ditches within some of them must be an indication of a connection between these two types of features.

The enclosed area is often between 1ha and 6ha, but can be up to 120ha, as at the Michelsberg site of Urmitz, Germany (Lehner 1910, 8–9). At most sites only a small part of the interior has been uncovered, although large parts have been investigated at some. They usually produce very few structures, mostly small pits which seldom contain datable finds. At sites like Chatenay, Gravon, Grisy, Offham Hill, and Briar Hill there were abundant finds in the ditches but nothing in the interior (Drewett 1977, 211; Bamford 1980, 363; Mordant and Mordant 1988, 244–246). When interior features do occur they often cluster, leaving most of the interiors completely empty: this was evident at Sarup I and II (Andersen 1997, figs 64 and 98), and at Etton where intense activity was found only across the eastern part of the site (Pryor 1998, fig. 103). Buildings such as houses have not yet been found in the interior area. At the Chasséen South site of Saint-Michel du Touch near Toulouse, a ‘Grubenhaus’-like feature was uncovered, perhaps a structure used for special functions (Cap-Jédikian et al. 2008, 182–184). The nearby site of Villeneuve-Tolosane yielded structures containing burnt stones measuring up to 12m long and 2m wide (Vaquer 1986, 240), and just south of this site we have Cugnax, where a series of pits near the ditches contained human burials (Gandelin and Vaquer 2008, 36; Gandelin 2011, 141–146).

Pits and features in the interior seem to have contained special deposits of human bone and various objects. Some discoveries show a link between special finds in the interior pits and the system-ditches, for example at Windmill Hill or Hembury, England, where sherds from the same vessel occur both in a ditch and a pit (Smith 1971, 96). At Sarup II, sherds from the same fine decorated vessel were found in three ditches and four pits (Andersen 1999, fig. 6.8).

Areas outside enclosures have only rarely been uncovered. At Sarup II no features were found (Andersen 1997, fig. 74), but at Klingenberg about 300 pits were found in an area of 3.5ha inside and outside the ditches (Seidel 2008, abb. 206). These pits contained special finds like aurochs horns, collections of animal bone, miniature axes, and female breasts of loam, along with three pits with human bone. Here the pits inside and outside the ditches appear to have had a common function.

ENCLOSURE FINDS

Artefacts and other materials recovered from causewayed enclosures must have been specially selected before deposition and a large number were exposed to special treatment.

Human remains

Very little of the human bone recovered from enclosures has been thoroughly analysed, but fortunately, the recent publication of Hambledon Hill (McKinley 2008) and the three German sites at Heilbronn (Wahl 2008) offer systematic taphonomic analyses of these remains and provide a clearer picture of post-mortem treatment. It appears that what happened to the human bodies and bones before their deposition at these sites was typical of many other enclosures (e.g. Tempelhof 2 in Germany (Geschwinde and Raetzel-Fabian 2009, 295); Etton (Armour-Chelu 1998, 271–272), Windmill Hill (Smith 1965, 136–137; Brothwell 1999), and Haddenham (Dodwell 2006, 306) in England; and many of the French sites (Pariat 2007)).

The analyses by McKinley (2008) and Wahl (2008) show that the human remains had been handled several times prior to deposition in the ditches. No complete human skeletons were found—unlike at the French sites of Villeneuve-Tolosane, Cugnax (Vaquer et al. 2008) or Grisy, the latter producing two juvenile skeletons at the base of a ditch as if contained in a sack (Mordant 1989, fig. 82). Rather, we find either parts of a skeleton with two or more articulated bones or single bones disarticulated from the rest of the body, indicating that parts of a corpse were brought to the place of deposition, often with flesh and/or sinew attached. Bone fragments from Hambledon with visible traces of gnawing by carnivores (dogs and/or foxes) and/or rodents (McKinley 2008, 494) show that fresh human remains were readily accessible by these animals (Wahl 2008, 789). Few carpal and/or tarsal bones, which would indicate the quick covering of the human remains, were found. The material from Heilbronn had carnivores' teeth marks only on the left side of the carcasses/skeleton, interpreted as meaning the bodies were originally placed on their right side in a low hollow (Wahl 2008, 789).

But many of the bones must have been 'old' when deposited in the ditches, on account of signs of weathering and root-etching (Healy 2008, 23). In other cases, dried bones were found, indicating a deposit of collected bone material which for some years must have been contained elsewhere (Smith 1965, 137). It is of interest that some of the articulated skeletal parts had differential weathering or root-

etching across the bones (McKinley 2008, 492), and at Hambledon 7% of the bones have cut-marks, taken not so much as a sign of filleting or defleshing, more as a product of cleaning the bones (McKinley 2008, 498–499). Some of the dried bones had been burned by high temperatures, again demonstrating their deliberate preparation prior to deposition.

Human skulls often receive special treatment, and seem to have been deposited as dry bones, already disarticulated. At Hambledon eight of the 15 skulls were placed on the ditch floors (McKinley 2008, 513); at the German sites some skulls have been interpreted as trophies, where they are thought to have been put on display on a pole (Wahl 2008, 780–784; 2010, 96–101). The Heilbronn sites also produced several skulls of children and young people (less than 20 years old) (Wahl 2008, 786). Some of them have signs of a heavy and deadly blow on their right side, perhaps indicating deliberate killing as a result of being hit from behind, maybe during an offering that involved children (Wahl 2008, 762; Jeunesse 2010, 93).

Human bone was clearly deposited in different ways. Fragments of the same bone could be placed in separate parts of a ditch or in different ditches (Wahl 2008, abb. 7–10). Skulls, for example, are found in many pieces distributed between several ditches (Lüning 1968, 236) or placed beside hearths and upon platforms in the ditches (Piggott 1954, 47; Evans and Hodder 2006, 253–255). At Windmill Hill we see the cranium of a child nested within an ox frontlet (Whittle et al. 1999, fig. 82). From the same site a child's femur was placed within the marrow cavity of an ox humerus (Whittle et al. 1999, fig. 161). At Staines near London, parts of the same arm were found in two ditches 94.4m apart (Robertson-Mackay 1987, 36). Burnt human bone is also known, like that from Briar Hill on a platform within a ditch (Bamford 1980, 363; 1985, 32–33; Cullen 1985). Some skeletons were placed in special features. At the bottom of a Michelsberg culture enclosure at Bruchsal-Aue in Germany, a 1.5m-deep shaft had been cut leading down to a chamber in which an elderly man had been buried (Behrends 1991, 32–33). Further pits containing human remains were located at the bottom of its ditches, including two complete child burials covered by the remains of an older woman and marked at the base of the ditch by a quantity of animal bones (Behrends 1991, abb. 29).

Human bone occurs in other features both inside and outside enclosures. Burnt bone from excarnated bodies was found in two postholes and a pit within Sarup II; the remains from two of these were quite possibly from the same person, a young woman (Andersen 1997, 86). At other sites where large areas have been uncovered, pits with human bone have similarly been found, as at the Stepleton

Enclosure, on Hambledon Hill, where three pits had human bone in their fills (Mercer and Healy 2008, 275), or at Klingenberg, where three pits contained the fragments of two newborn children and an older woman (Wahl 2008, 719–722). At the Chasséen site of Jonquières in France, the skull and lower jaw of an 8-year-old boy were recovered 8m apart in a palisade trench (Poulain and Lange 1984, 265), and at Sarup I a burnt human finger-bone was found between crushed burnt bone, again in the palisade trench (Andersen 1997, 34).

These examples demonstrate how various parts of the enclosures—ditches, internal pits, and palisades—were host to a complicated pattern of activities involving human skeletons or human bones. Their treatment is paralleled by other materials.

Animals

Animal bones, particularly of cattle, are found in great numbers in the ditches and pits. They often appear to have been just as carefully treated as the human bones. Evidence from the latest excavation at Windmill Hill, and from the above-mentioned sites at Heilbronn, suggest we have to think of the animal bones as more than just ‘rubbish’ (Whittle et al. 1999, 361; Seidel 2008, 380). Detailed analyses from these sites demonstrate a high proportion of cattle bones which were often articulated and must have been deposited with the flesh intact. They were not, therefore, always the remains of meals. Other animal bones were weathered and again have signs of root-etching, demonstrating, as with the human material, previous deposition some years before interment in the ditches (Whittle et al. 1999, fig. 183; Stephan 2008, 173). The less formalized deposits contained bones of pig, sheep, and goat in greater numbers.

As for humans, animal skulls were given special consideration, as at Whitesheet Hill in England, where an ox skull was deliberately covered with a small heap of stones (Smith 1965, 16), at Bjerggårde (Denmark), where three or four dog skulls were uncovered (Madsen 1988, 310), and at Hygind (Denmark), where up to three ox skulls lay in a heap (Andersen 1997, fig. 287). At Bruchsal-Aue, Germany, a pair of aurochs horns marked a woman’s grave and horn cores had been placed at the ends of the system-ditches (Behrends 1991, abb. 26 and 30; 1994, abb. 15). A very special find came from the Matignon site of Champ Durand in the Vendée, where a cow’s skull in a ditch showed evidence of trepanation (Joussaume 1988, 280).

Material culture

Whole pots, turned upside down, were placed at the bottom of the ditches, as at Noyen I (Tarrête 1979, 459, fig. 21) and Etton (Pryor 1998, 33, fig. 31). Perhaps these inverted bowls symbolized a skull (Pryor 1987, 79). At other sites, a lot of vessels could be placed at the bottom of the ditches—for example, at the Michelberg site of Bazoches (Dubouloz et al. 1997, 133)—but at many ceramics were often represented by part of a vessel, which furthermore had undergone a transformation through a process of intentional fragmentation, as with bone (Andersen 1997, figs 65–66; 2008, fig. 10; Cassen and Scarre 1997, fig. 56; Whittle et al. 1999, 358; Raetz-Fabian 2000, 73). It seems often to be fragments of open bowls which are represented on the sites, but detailed comparisons need to be made with material from ‘normal’ settlements.

Flint has been located in very variable quantities. Most of it has been found with deliberately deposited refuse materials. At Sarup I, there was a higher ratio of tools to debitage when compared to settlement sites (Andersen 1999, 279). Flint and stone axes were also found, but not in great quantities. Of special interest is the axe fragment from Haddenham, which was placed on a platform in a ditch together with fragments of human skull (Evans and Hodder 2006, 253–255), and the axe from Magheraboy which was surrounded by 30 fragments of quartz crystal (Danaher 2007, 113).

Quernstones have been found at several sites, often as fragments (Andersen 1997, 340 n. 264; Whittle et al. 1999, 341). At the Matignon site of Mastine, Charente-Maritime, a quernstone weighing 20–30kg had been brought from a quarry a dozen kilometres away (Cassen and Scarre 1997, 180). At Etton, querns were only found in the eastern half of the site, including its interior pits (Pryor 1998, fig. 114). Querns are primarily associated with processing grain and perhaps burned bones, which were found as a ground bone meal by the palisade at Sarup I and in the ditches at Briar Hill (Andersen 1997, 34; Cullen 1985).

Two large handfuls of carbonized emmer wheat were found in two jars placed within 5m of each other within Sarup I. The fact that the emmer is not mixed with other species contrasts with nearby settlements and with evidence from pollen analysis which reveals an abundance of barley from the area (Andersen 1997, 62). The wheat seems to have come from two different fields and to have been specially selected for this structured deposit (Westphal, unpublished).

At Windmill Hill, and other southern English sites, a variety of carved chalk objects were found representing phalli and figurines (Smith 1965, fig. 57), and at Klingenberg female breasts made of loam were uncovered in some of the pits (Seidel 2008, 301–308). These finds hint at the possible importance of fertility symbolism at some

sites (Whittle et al. 1999, 366).

Some, perhaps most, of this material must be perceived as deliberately placed and subject to extensive transformation. It seems that the material could have been collected from different places or sites prior to deposition in the ditches. Careful analyses of the ditches from Windmill Hill give the impression of an individual history for every segment (Whittle et al. 1999, 368).

CONCLUSION

In summary, the causewayed enclosures of western and northern Europe were very large and often highly visible sites. They were built in one operation, involving the investment of many days' work by a large number of people. Before their construction the work must have been planned for some years, the area being cleared of vegetation and big stones, with trees for the posts and palisades selected, prepared, and transported. The enclosures often seem to have been placed at regular distances from each other and sometimes close to clusters of megalithic tombs. Specially treated artefacts were deposited. The ditches, within which specially treated artefacts and both human and animal bone were deposited, seem to have been open for a very short period, in some cases perhaps for a few days only, before being carefully refilled again. Later the ditches were reopened and new deposits placed in them. This could have happened again and again, involving the same type of deposit as in the first instance. Thorough analyses of some ditches show that later deposition mimicked earlier ones in both form and content, and there must have been a type of grammar by which former depositions were remembered (Whittle et al. 1999, 368). Perhaps every single ditch represented a group of people, a family, or a team, and in the layout of the enclosures we have a metaphor for the occupation of the local area, each settlement united into a network by a single, large construction (Andersen 1997, 306; Whittle et al. 1999, 384). In the cyclical thinking which characterized early agricultural lifestyles the ditches were perhaps regarded as symbolic furrows where the material of life was 'sown' for later rebirth.

Causewayed enclosures were built and used, especially in northern Europe, up to 500 years after the introduction of the Neolithic economy to an area. They seem to have been constructed within a short intense period of each other and re-used in the following centuries (Whittle et al. 2011). Often their building coincides with the first signs of ploughing with the ard and the opening of the landscape, activities which must have demanded a close-knit network of people—

a network which would require reinstating from time to time. The enclosures can be considered as central places for these activities, offering a medium by which to organize large numbers of people during the transformation from a Mesolithic/semi-Neolithic way of life to a full blown Neolithic existence (Andersen 2011). This change is the most fundamental in the history of humankind and its great success seems to have been dependent on a ritualized life played out at causewayed enclosures.

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CHAPTER 43

CHAMBERED TOMBS AND PASSAGE GRAVES OF WESTERN AND NORTHERN EUROPE

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INTRODUCTION

ACROSS swathes of north-west Europe a number of early farming communities constructed chambered tombs as part of a broader monumental tradition that also included standing stones, stone settings, and enclosures. In France the first chambered tombs date to the early/mid-fifth millennium BC and in Britain and northern Europe similar structures appear during the early fourth millennium BC. Some were exclusively of timber and earth, but the most striking are those that were constructed of stone. This group of Neolithic monuments is known by many names: dolmens, passage graves, long cairns, long mounds, tumuli, and chambered cairns. They share the presence of a chamber, within which the remains of the dead were interred (see [Fowler and Scarre](#), this volume; [Sjögren](#), this volume). The precise configuration of these monuments, however, varies considerably in different regions. Some chambers were constructed with massive (megalithic) stone slabs, whilst others were built using dry-stone walling. Equally, some contained large numbers of inhumations, whilst others contained only single inhumations or cremations. The Neolithic chambered tombs were used in regionally varied ways and had different histories of use and re-use.

These monuments have been the focus of interest since antiquarian times. Their high survival rate has meant that generations of archaeologists have been able to study them, generating an enormous literature, which this chapter can do no more than summarize. In order to illustrate the variety represented by chambered tombs we will present brief overviews of the regional sequences in three key areas of northern and western Europe: (1) France and Iberia; (2) northern

Germany, Holland, and southern Scandinavia; and (3) Britain and Ireland. In the second part of the chapter we will discuss some key themes, and indicate potential areas for future research.

NEOLITHIC CHAMBERED TOMBS OF FRANCE AND IBERIA

In Iberia, three principal categories of chambered tomb can be identified: the closed megalithic chamber, the megalithic passage grave, and the dry-stone corbel-vaulted or 'tholos' tomb. The last term remains widely in use but refers simply to the constructional technique; it does not indicate a derivation from the Bronze Age tholos tombs of the Aegean. The megalithic passage graves are the most abundant and widespread of the three categories, but the earliest Iberian funerary monuments may have been small box-like cists. In Galicia, the sequence began c. 4300 BC with a series of simple megalithic chambers covered by a cairn or mound ([Arias and Fano 2003](#)). Passage graves appeared c. 3800 BC, and over time became increasingly elaborate. Chambers expanded in size and projected above the enclosing mounds; passages became progressively longer and were preceded by forecourts. The emphasis on ceremony, access, and display climaxed in the late fourth millennium BC, when chambers sometimes attained a length of 7m or 8m ([Criado 1989](#)). The process then reversed during the third millennium, when closed chambers under mounds of modest dimensions once again became dominant.

Small closed megalithic chambers may also have been the earliest form in the central Alentejo region of southern Portugal. Their origin may lie in the late sixth millennium BC, but the well-known passage graves of the Alentejo mostly date to the fourth millennium ([Oosterbeek 2003](#); [Calado 2006](#), 82). Largest of all the Alentejan passage graves is the Anta Grande de Zambujeiro, with chamber orthostats up to 6m in height and weighing over 20 tonnes. The dominant materials are granites and related rocks, and the geology and acidic soil mean that (as in Galicia) human remains are not generally preserved. Multiple inhumation is however attested in the contemporary passage graves of the limestone Estremadura region immediately to the north-west. The engraved schist plaques found in many of these south-west Iberian passage graves are also consistent with the practice of multiple inhumation, even where human remains do not survive. At Cabeço da Arruda 1 near Lisbon, 11 such plaques were found with the remains of at least 19 individuals. In the Alentejo, much larger quantities of plaques were recovered from tombs such as Olival da Pega (134) and Escoural (167), suggesting correspondingly large numbers of inhumations ([Lillios 2008](#)).

Iberian megalithic tombs can be of mixed megalithic and dry-stone construction, but the use of dry-stone is a particular feature of the so-called ‘tholos’ tombs constructed in southern Spain and Portugal from the end of the fourth millennium BC. They include famous examples such as Los Millares in Almería, the Cueva de Romeral at Antequera, and the Alcalar tombs in the Algarve. Tholos tombs are typically circular dry-stone chambers covered by a tall corbelled vault. Radiocarbon dates suggest that they were built within a relatively restricted period around 3100–2900 BC ([Sanjuán 2006](#)). The construction of these chambers appears unconnected with the corbel-vaulted passage graves of Brittany which may be as much as 1,500 years older.

A notable feature of Iberian chambered tombs is their carved and painted decoration. Recycled decorated menhirs have been identified in several tombs, such as Dombate in Galicia, where a carved slab bearing a series of ‘whale’ motifs appears to have been in place before the chamber was built around it, suggesting that it was originally a decorated free-standing menhir ([Bello Dieguez 1997](#)). In addition, at Dombate all the orthostats of the passage and chamber have traces of painted art on their bases, where they have survived through being protected by the build-up of deposits. The motifs were painted in red and black on a white-cream foundation layer of carefully sieved kaolin. Since this white-cream foundation layer continued across the interstices between the stones it is clear that the painted decoration formed a continuous surface around the chamber’s interior. A complete decorative scheme of painted motifs is preserved at Antelas in Portugal ([Jorge 1998](#)). AMS dating of the charcoal incorporated in the paint of these and other sites places the decoration in the late fifth or early fourth millennium, and at least one case indicates a repainting of the chamber several centuries after its initial decoration ([Steelman et al. 2005](#)).

Megalithic art is also a notable feature of chambered tombs in northern and north-western France. Here, too, there is evidence for the use of painted decoration, although many of the motifs were carved on decorated menhirs which were later dismantled and incorporated in tombs. In some cases, separate pieces of one standing stone were incorporated into tombs several kilometres apart. As in Portugal, the earliest megalithic monuments in Brittany were probably standing stones, though these may have been contemporary with long mounds containing closed megalithic chambers, for which a mid-fifth millennium date can be proposed ([Scarre 2011](#)). The early long mounds range from structures of modest scale with small internal burial cists, such as Le Manio 2 (35m in length), to the gigantic ‘Carnac mounds’ (up to 120m long and 10m high). Carnac mounds

such as the Tumulus de Saint-Michel cover megalithic chambers containing rich grave assemblages, including exotic variscite beads from north-west Iberia and jadeitite axes from the western Alps.

In Brittany, the closed chambers of the early long mounds were succeeded after two or three centuries by the first passage graves, either of megalithic construction and roofed by capstones, or with dry stone walls and corbelled vaults. In north-west France both types appear to be contemporary or nearly contemporary: they occur side by side, for example, in the multi-chambered cairn of Barnenez. Megalithic art in the form of recycled menhirs is found in passage graves alongside much rarer examples of freshly carved art, such as the dense geometric designs covering 23 of the 29 orthostats at Gavrinis ([Le Roux 1992](#)).

Knowledge of funerary practices in the famous Brittany tombs is hampered by the poor preservation of human bones. Skeletal preservation is much better in the chalk and limestone basins to the south (Poitou-Charentes) and east (Paris basin), where sequences of funerary activity can be analysed by AMS dating. Excavations at Condé-sur-Iffs in Normandy and Prissé-la-Charrière in Poitou-Charentes have revealed that whilst many passage graves were re-used in later stages of the Neolithic, the original interments were often relatively few in number. At Condé-sur-Iffs, individual bodies were laid out alongside each other and left undisturbed ([Dron et al. 2003](#)). At Prissé-la-Charrière, the sequence begins with a simple closed chamber within a dry-stone surround, proceeding through successive stages of enlargement and elaboration and culminating in a massive 100m-long mound of cellular construction ([Scarre et al. 2003](#)). This mound also incorporated two passage graves (one pre-existing), demonstrating that the relationship between long mounds and passage graves is not the simple succession that has sometimes been supposed.

The passage graves of north-western France were most likely constructed in the period 4200–3800 BC. In the mid-fourth millennium a new phase of chambered tomb construction saw an emphasis on elongated chambers with entrances on either the long axis (variously known as ‘allées couvertes’ or ‘allées sépulcrales’) or from the side (‘sépultures à entrée latérale’). The Breton ‘allées couvertes’ are associated with a new repertoire of carved motifs (discussed later) which included paired female breasts and is also encountered in the ‘allées couvertes’ and rock-cut tombs of the Paris basin, where good bone preservation revealed that these chambered tombs sometimes contained remains of several hundred individuals (e.g. some 250 skulls at La Chaussée-Tirancourt; Masset 1997). Many French passage graves were reopened at this period and large numbers of new interments introduced (see also [Fowler and Scarre](#), this volume). In

numerical terms, however, the most striking feature of this late Neolithic phase is the construction of hundreds if not thousands of megalithic tombs, generally of modest dimensions, on the limestone plateaux of the Causses in south-central France.

It is important to emphasize that the Neolithic chambered tombs of France and Iberia were not the only monuments of their period. As well as the decorated standing stones of both regions, there were many undecorated standing stones and stone settings, notably the ‘cromlechs’ of the Alentejo and the famous stone rows of Brittany that reached their apogee in the Carnac alignments. Chambered tombs were only one element in a wider family of monuments which owed their particular character to the way in which they drew on elements of the natural landscape—megalithic blocks—for their construction. Furthermore, the patterned use of different stone types within individual monuments highlights the symbolic significance that the stones and their sources must have possessed for their builders.

NEOLITHIC CHAMBERED TOMBS IN NORTHERN GERMANY, HOLLAND, AND SOUTHERN SCANDINAVIA

Undoubtedly, megaliths are the most tangible prehistoric remains in northern Europe, dramatic and enticing structures with a particularly powerful presence in the generally flat landscapes. In contrast to other regions, their construction belongs to a clearly defined cultural horizon—the Funnel-necked Beaker culture (*Trichterbecherkultur*; c. 3700–3100 BC)—although many continued in use throughout the later Neolithic and even into the Bronze Age. Whilst many tombs had been destroyed by the nineteenth century (for example, only 54 of the 254 originally recorded tombs survive on the island of Rügen), there are records for well over 12,000 megalithic tombs—more than half of them from Denmark—and an estimate of about 40,000 having been built originally would not be an exaggeration ([Midgley 2008](#)).

North European megaliths are by no means evenly distributed. There are zones of dense concentrations—for example on the Falbygden plateau, along the coastal regions of Scania, on the Danish islands, in Mecklenburg, or on the Drenthe plateau—interspersed with a rather more even spread, as well as areas largely devoid of megaliths ([Bakker 1992](#); [Ebbesen 1985](#); [Schuldt 1972](#); [Sjögren 2003](#)). Clustered and scattered distributions reflect historical developments within individual regions, and variations in topographical locations—whether along the coasts, focusing on moraine ridges, river valleys, or easily navigable passes—similarly reflect geographical and local social conditions.

In conventional terms, the classification of megalithic chambers in northern Europe follows the Scandinavian sequence, whose origins reach as far back as Ole Worm's early attempts at typology (Worm 1643). J.J.A. Worsaae (1843) continued the use of earlier terms such as the *Stendysse* (dolmen) and the *Jættestue* (passage grave); dolmens could be further divided into *Langdysse* (dolmen in a long mound; Fig. 43.1a) and *Runddysse* (dolmen in a round mound; Fig. 43.1b). Modern scholarship has come a long way from the earlier concern with inventories, descriptions, and typological ordering, and later twentieth century studies have shown that megaliths *sensu stricto* represent only one of many facets of Neolithic burial traditions in northern Europe. Indeed, most of the dead were relegated to future oblivion, their bodies placed in inconspicuous flat graves, pits, and ditches and known to us today only through accidents of archaeological discovery.

(a)



(b)



FIG. 43.1. North European dolmens: (a) reconstructed long dolmen at Munkwölstrup in Schleswig; (b) round dolmen at Bautahøj on Zealand.

The monumental sequence in northern Europe, as understood at present, begins with earthen longbarrows which, towards the end of the fifth millennium BC, formed veritable cemeteries across the North European Plain and, slightly later, expanded further north, where barrows tend to be found singly or in pairs. These monuments, with their timber chambers, wooden façades and huge earthen mounds, form the prelude to the emergence of megalithic architecture ([Midgley 2005](#)). The closed and early open dolmens, well established by 3700 BC, are thus replicas of these timber chambers, whose own architectural variety must have been considerably greater than the surviving vestiges suggest. The simple rectangular dolmen was the commonest form across the whole of northern Europe and, in its closed version, was built of four to six boulders of roughly equal height, and one massive capstone placed longitudinally upon them; normally such chambers are only large enough for one extended human body ([Fig. 43.2](#); [Andersen 1997](#), [Nielsen 1984](#)). The transition from a closed to an accessible chamber, at a time when both timber and stone chambers were still used, was not merely an architectural but also an important functional change. It facilitated repeated access to the interior via an opening and, later, a stone-built passage, and was accompanied by a profound change in burial custom, with a focus for ceremonies outside the entrance.

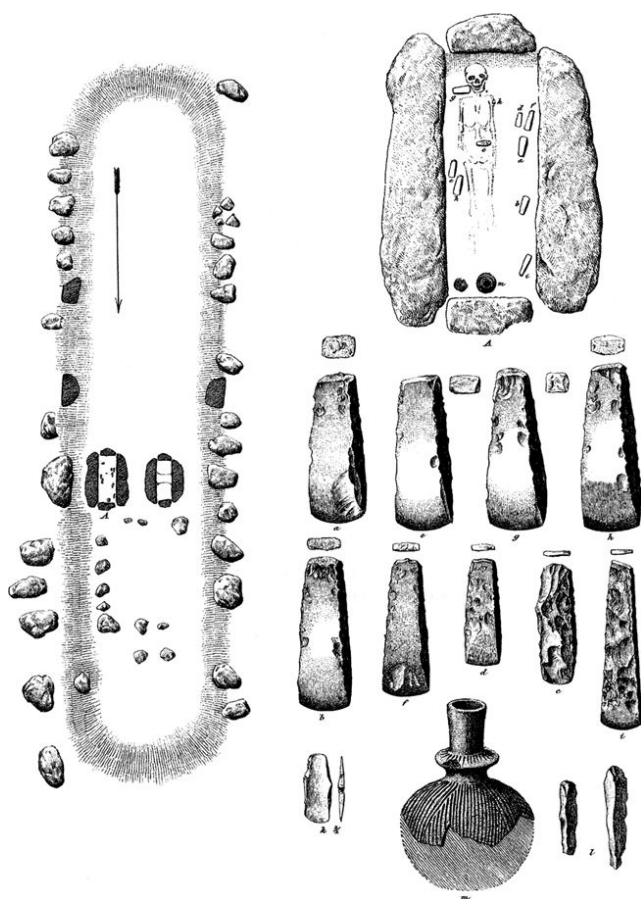


FIG. 43.2. Burial and accompanying grave goods from the long dolmen at Bogø, Zealand.

Although architecturally simple, the open dolmens were sophisticated constructions, employing elements in use throughout the time of megalithic building and culminating about 3300/3200 BC in elaborate passage graves (Bakker 1992; Hansen 1993; Schuldt 1972; Sjögren 2003). In the north European continental nomenclature, a passage grave is a chamber entered by means of a passage which, in contrast to an open dolmen, is at an angle to the long axis of the chamber, thus leading from one of its long sides (Fig. 43.3). Whilst most passage graves are rectangular or oval, there are many regional variants in ground plan, three-dimensional appearance, and, perhaps most significantly, the application of a great store of skill and knowledge in handling raw materials, solving architectural challenges, and understanding the symbolic meaning of both.

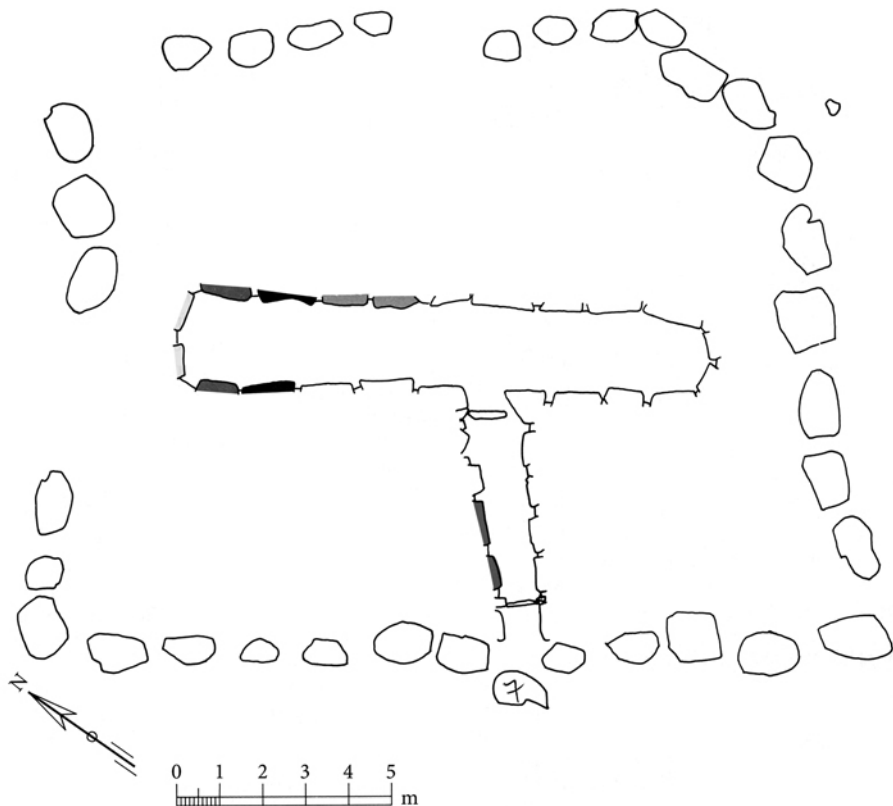


FIG. 43.3. Plan of the passage grave chamber at Kong Svends Høj, Lolland (after [Dehn et al. 1995](#)).

The building of megalithic tombs—the chambers and the covering mounds—was one of the great Neolithic crafts. Master builders and their apprentices combined great technological expertise with profound knowledge of the different properties of building materials, as well as the esoteric knowledge of the rituals and symbolic requirements needed for the megaliths to function. They made huge boulders stand on end, split and symbolically arranged halved stones as orthostats, skilfully manoeuvred capstones many tonnes in weight over loose piles of stones, employed sheets of folded birch bark to protect the fragile slabs from the shock of the heavy capstones, and made the chambers impervious to water ([Fig. 43.4](#)).

(a)



(b)



FIG. 43.4. (a) Passage grave of Rævehøj, Zeeland, displaying an intermediary stone layer supporting capstones. (b) ‘Twin stone’ capstone on the Poskær Stenhus dolmen, Djursland peninsula.

Size mattered, but perhaps not always in the way we understand it today. Sometimes it was expressed through length and width, for example on the Hümmling and around Osnabrück, in Lower Saxony, where the presence of massive glacial boulders resulted in the creation of some of the largest chambers; that of König Surbold, destroyed in the late eighteenth century, was 17m long and up to 6m wide (Laux 1989; Midgley 2008, 75, fig. 3.24). Elsewhere, size seems to have

been expressed more subtly by increasing the basic architectural units of construction: the number of pairs of orthostats, the positioning of capstones, or a different volume created by a polygonal or trapezoidal shape.

The pinnacle of the megalithic construction in this region has to be the twin passage grave, of which about 30 survive in Denmark. Here, two chambers—each with its own passage—were built sharing a common wall of one or two orthostats (Dehn and Hansen 2006a, b; Dehn et al. 1995, 2000). The most sophisticated chambers in this category are, in fact, mirror images in shape and ground plan, emphasizing once again both the skill and ingenuity of the builders and the symbolism associated with Neolithic concepts of duality.

The refinement of burial architecture went hand in hand with the elaboration and complexity of funerary ritual. Whilst the accessibility of the chambers facilitated repeated use of the interior, the different patterns of deposition of human remains within the megalithic chambers demonstrate different ways of dealing with the dead. The initial emphasis on individual burials within timber chambers and early dolmens—accompanied by a stereotypical set of grave goods such as collared and/or lugged flasks, flint blades, and axes—slowly gave way to greater concern with the dead in their ancestral capacity. The original deposits within open dolmens and passage graves involve selected fragments of human remains. Subsequently, some chambers may have become family vaults, with complete bodies placed within them, although elements of secondary burial—bone rearrangements, skull displays, and manipulation of other body parts—may have continued (Midgley 2008, chapter 4; see also Sjögren, this volume).

NEOLITHIC CHAMBERED TOMBS IN BRITAIN AND IRELAND

There are a wide variety of chambered tombs in Britain and Ireland, but prior to their construction, a number of wooden mortuary structures existed, some preserved under later stone structures, for example at Pitnacree, Lochhill, and Slewcairn, all in Scotland (Noble 2006, 71–101). These wooden structures vary in size and shape from quite simple boxes to much larger architectural forms, and were used for the deposition and/or exposure of human remains (Kinnes 1992b; Whittle et al. 2007). There was also an early Neolithic non-megalithic tradition in Britain, where long cairns and barrows were built but without stone chambers (Kinnes 1992a).

From around 3800 BC (Whittle et al. 2007) people started to construct megalithic chambered tombs. As these sites were built in

stone, many have been preserved in the landscape, giving us a good sense of their overall distribution. They were not constructed in all parts of Britain and Ireland in the early Neolithic ([Fig. 43.5](#)), but are found in discrete clusters. In Britain, this includes a spread of sites in the Cotswold–Severn region, the west coast of Cornwall and Wales, and a large number in western Scotland from Dumfries and Galloway up to and including the Outer Hebrides. In eastern Scotland there is a distinctive cluster from the Black Isle up through Sutherland and Caithness, with further concentrations on the Orkney and Shetland Islands. Other islands in Britain have chambered tombs, including the Isle of Man and the Isles of Scilly, although sites on the latter are not securely dated ([Robinson 2007](#)). In Ireland, early Neolithic chambered tombs are found in large numbers throughout the north and in smaller clusters in pockets in the south. It is clear, then, that broad swathes of Britain and Ireland saw monumental construction in the early part of the Neolithic.

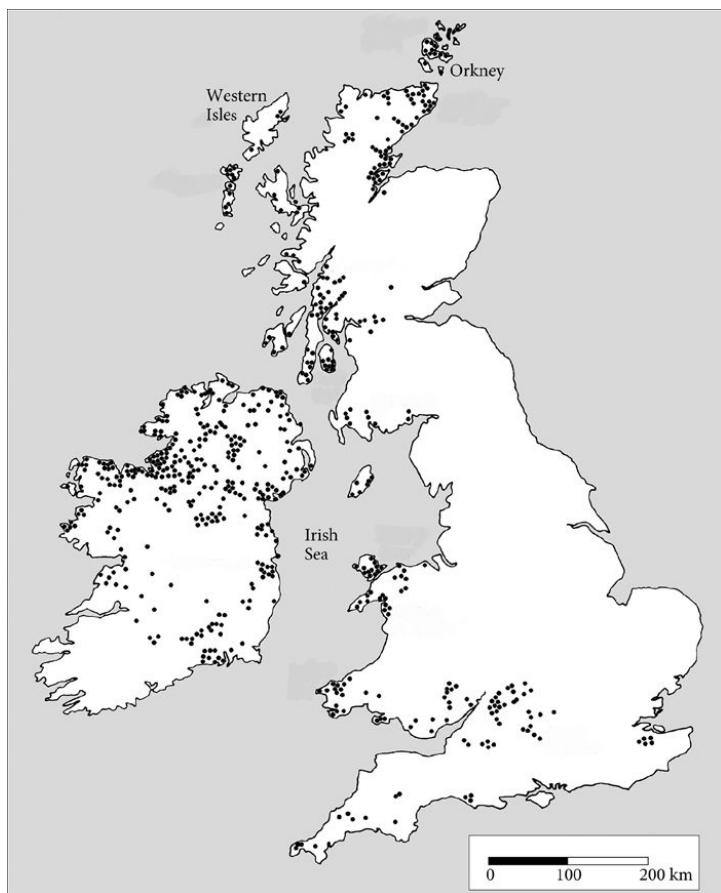


FIG. 43.5 Map of the British Isles indicating regions with dense concentrations of Neolithic chambered tombs.

All early Neolithic chambered tombs share one thing: the presence of a chamber for the deposition of material culture, often, but not always, including the remains of the dead. There are considerable differences, however, in the shape and size of the chamber: some are massive, enabling people to walk in, move around, and deposit large quantities of material culture, including human and animal remains and pottery. Others are much smaller, would not have been large enough for people to enter, and could only ever have held a limited amount of material. In addition, some stone-built chambered tombs have multiple chambers—some built in sequence over time, others constructed in one go. How chambers were created also varies between regions: some sites employed massive slabs to create simple box-like chambers, for example amongst the Clyde cairns of western Scotland ([Cummings 2009](#)). At other sites the chambers were created using smaller stones for dry-stone walling and corbelled roofs as in the Hebridean cairns ([Henshall 1972](#)). Diversity in the British and Irish sequence is not restricted to the size and shape of the chamber. Some chambers were set within long cairns or mounds, whilst others were in round cairns. Cairns could have large forecourt areas at one end, where a façade of tall stones created an area where people could gather and conduct rituals. There is evidence of this at many sites, for example at West Kennet in Wiltshire and Cairnholy I in Dumfries and Galloway. But again this was not a universal feature: some sites have no defined area for the gathering of people. In terms of architecture, then, the British and Irish sequence sees considerable diversity.

Two of the main forms of early Neolithic chambered tomb in Ireland highlight the kinds of architecture people were constructing at this time, and how these sites could vary in form. Approximately 230 court cairns are known from throughout the northern part of Ireland; these are large and impressive sites. The chamber area consists of a series of small ‘boxes’ used for deposition (see [Herity 1987](#)). Access was most likely gained by removing the roof slabs. The outermost chamber was connected to the outside of the monument via a large and impressive stone-built façade, which also created an open ‘court’ area for people to gather. The entire structure was encased within a large stone cairn (see de Valera 1960). For example, at Ballymacdermot, Co. Armagh, a series of box-like chambers lead to a semi-circular court suitable for many tens of people to congregate. Similar monuments are found in Britain, and whilst the precise architectural configuration varies, some general themes are the same: one or more large chambers, a forecourt area, and the presence of a large long cairn or mound. These features are shared at Cotswold–Severn sites, the Clyde cairns of western Scotland, and those in Caithness, Sutherland, and Orkney (see [Henshall 1963](#)).

At the same time that the court cairns were being constructed, 'portal dolmens' were also being built in Ireland. They are less numerous and more dispersed than court cairns: approximately 170 are known from the whole of Ireland, whilst variants are also found in west Wales (Cummings and Whittle 2004) and Cornwall (Bradley 1998a; Kytmanow 2008). They are found primarily in the south, although their distribution overlaps with court cairns in places (Shee Twohig 1990, figs 12 and 21). It is their form, however, which really sets them apart from court cairns and similar monuments. Their main feature is a large stone 'box', often capped with a massive slab or boulder, some weighing in excess of 50 tonnes. In contrast, the chambers beneath were often small and would not have been easily accessible once constructed. Few have forecourts and most are located in small round cairns.

All of these chambered tombs were constructed in the early Neolithic, probably in the few centuries around and after 3800 BC, and many continued to be used for considerable periods of time, in some cases into the late Neolithic, such as West Kennet in Wiltshire. Others were 'reused' (i.e. they saw subsequent material culture additions) in the early Bronze Age, although it seems likely that these sites simply continued to be key locations over long periods of time. This causes problems in ascertaining precise construction dates, so in many areas we only have a rather general idea of when sites were constructed and used. We do know, however, that the middle Neolithic (c. 3400–2900 BC) saw the renewed construction of chambered tombs known as passage graves, primarily in Ireland but with a few sites on Orkney and two on Anglesey in north Wales. These large passage graves are notably different from the early sites. First, there are only very limited numbers in very specific areas of Ireland and Britain. Secondly, they have much larger and more impressive chamber areas which are also set further into the cairn or mound and therefore have a much longer passage between the chamber and the exterior. The most spectacular examples are found in the Boyne valley, with Newgrange, Knowth, and Dowth (Eogan 1986). In Ireland middle Neolithic passage graves are also found in 'cemeteries' alongside one another and early Neolithic tombs. Further unique elements of passage graves are their frequent association with rock art motifs, which adorn the outer kerbstones and stones in the passage and chamber (Shee Twohig 1981), and the associated material culture. The Boyne valley monuments have large carved stone basins in the chambers, which had been used to hold deposits. At Knowth, a remarkable carved stone macehead was also found.

Cultural interaction and the question of origins

Determining the age of chambered tombs continues to prove an intractable and sometimes controversial issue. Nineteenth-century writers, such as the [Baron de Bonstetten \(1865\)](#) and [James Fergusson \(1872\)](#), assumed they had a common origin, and that their distribution through western and northern Europe was the result of cultural diffusion attributed to the travels of a 'megalithic' people. The diffusionist interpretation remained dominant until the 1960s when radiocarbon dates provoked new modes of interpretation. Among these was the argument that the tombs had independent origins in separate regions (Ireland, Scandinavia, Brittany, Portugal) through a process of parallel social change associated with the adoption of agriculture ([Renfrew 1976](#)). That view is no longer widely held and west European chambered tombs are today generally agreed to be linked by some degree of inter-regional interaction. Their precise chronology remains difficult to establish.

The structures themselves cannot usually be directly dated, although advances in luminescence dating of granite surfaces offer future potential provided the precision and reliability of the method can be refined ([Vafiadou et al. 2007](#)). Direct AMS dating has also been possible in exceptional circumstances, for example in Denmark where rolls of birch bark were inserted between the courses of dry stonework ([Dehn and Hansen 2006b](#)). In north-west Iberia, dates have been obtained for charcoal incorporated in the black painted motifs, but painted decoration was sometimes added several centuries after tomb construction (see earlier in the chapter; [Steelman et al. 2005](#)). The great majority of radiometric dates for chambered tombs come not from the structures themselves but from materials buried within or beneath them. In regions of limestone and chalk with alkaline soils, bone preservation is generally good and human remains in the tomb chambers can be dated directly. Recent studies employing large numbers of AMS radiocarbon dates on human skeletal material coupled with the careful examination of context and Bayesian statistical analysis have provided reliable and highly detailed chronologies for a number of chambered long mounds in southern Britain and similar chronologies have been proposed in the context of some north German tombs ([Bayliss and Whittle 2007](#); [Mischka 2011](#)).

Many of the most famous chambered tombs are found in regions (such as Brittany or the Portuguese Alentejo) where acid soils predominate and human skeletal material is less frequently preserved.

An outline framework is nonetheless available for most areas, but especially in these regions the traditional typological chronologies, based on tomb form or contents (notably pottery), remain dominant. Such typological schemes may successfully indicate relative sequences, but provide little indication of the rate and rhythm of change. The most striking feature of the detailed AMS sequences from southern Britain and south Scandinavia is the clustering of dates, suggesting that entire classes of chambered tomb might have been built in short spans of two or three centuries (Bayliss and Whittle 2007; Persson and Sjögren 1995). This stop-start pattern of tomb construction might equally apply to less precisely dated regions such as Brittany (Scarre 2001).

Evidence for long-distance contacts—seen through the dispersal of domesticated resources, raw materials, and finished artefacts—suggests that past models of indigenous local developments (Renfrew 1976) need to be balanced against inter-regional contacts resulting in shared cosmologies across vast swathes of north-western Europe. Irrespective of the regional variety of early tombs, the long mound, in its multiple expressions, was an important idea and such monuments often stand at the head of regional sequences; at the same time, it is clear many developed through successive extensions and aggrandisements. They were clearly burial monuments, as attested by the presence of human remains found within the timber-built and, along the Atlantic façade, stone-built chambers. However, they also embodied commemorative concepts that linked them with the ancestral past: some communities chose to emphasize the ancestral value of the Danubian longhouses in the external appearance of the mounds and, in some instances, veritable longbarrow cemeteries replicated the abandoned villages themselves (Laporte and Tinévez 2004; Midgley 2005). This commemorative significance of the long mounds was the first stage in the process of evolution of Neolithic world views in which the megaliths played a fundamental role. Over time the accessibility of chamber interiors became important, and this was accompanied by a profound change in the treatment of the dead and by a range of new ritual activities performed near the tombs. In architectural terms this was accomplished by the construction of dolmens and passage graves, frequently entered through long passages. Whilst chamber interiors never accommodated significant numbers of participants, their entrances, aggrandized with extensions, façades, and deep forecourts, created foci for ceremonial activities outside the tombs.

The materiality of megalithic architecture: labour,

materials, symbolism

Archaeologists studying chambered tombs often spend considerable time thinking about their final form. However, it is important to consider their life histories, in particular the effects the construction of a monument would have had on a community. [Colin Richards \(2004\)](#) and [Lesley McFadyen \(2006\)](#) have recently discussed these important issues in relation to the construction processes of chambered tombs in Britain. Considerable planning and effort was required before communities could even begin to construct a monument, which involved preparing components such as ropes and rollers, as well as selecting a suitable site ([Cummings 2007](#); [Richards 2004](#)). Stones would need to be dragged across the landscape, and people carefully wove different material substances from different parts of the landscape into the fabric of the monument ([McFadyen 2006](#)), perhaps representative of separate communities, events, or places.

Megalithic monuments were not simply made of stone: a complex array of materials was used selectively in their construction. Throughout the Neolithic there was an interesting interplay between timber and stone architecture. It involved, for example, a transition from burial monuments with timber elements—wooden chambers and massive timber façades—into those whose principal features were built in stone. On the one hand, this change may have been related to a practical aspect of land clearance, providing areas suitable for agriculture by cutting down the forests and removing large stones. In northern Europe in the early fourth millennium BC timber was largely abandoned in favour of the more durable stone in funerary monuments, but it continued to be employed, on a massive scale, at other ceremonial sites. Thus, at the causewayed enclosure of Sarup on Fyn, massive timber palisades were erected, for which thousands of oaks had to be cut down ([Andersen 1997](#)). The differences in the temporal qualities of stone and timber must have been important—offering suitable metaphors for distinguishing between the realms of the living and the dead—and those who built the longbarrows, megaliths, and enclosures would have held views on the desirability, appropriateness, and symbolism of the materials they used.

The megalith builders consciously employed certain raw materials for the symbolic significance of their colours and textures. Red boulders in the façades of some dolmens and passage graves, for example at Grønjægers Høj on Møn, at Nobbin on Rügen, or at Kong Svends Høj on Lolland, were chosen to create dramatic effects at certain times of day—at sunrise or sunset—and to provide theatrical settings for public ceremonies ([Midgley 2008](#)). Similar effects may have been desired outside Newgrange, in Ireland, where vast

quantities of quartz were present, or at Cairnholly I and II in Scotland, where the façade orthostats display dramatically different textures. Variations in shape, texture, and colouring of the stones in the stone rows of Brittany speak of deliberate positioning, permitting the manipulation of perspective and other visual effects. Exotic quartzite boulders, such as that at Grønjægers Høj, and other deliberately massive capstones, whose shapes and textures created particular visual effects, may well have protruded over the protective chamber mounds. Indeed, the igneous rock capstones covering the passage grave chambers of an extraordinary concentration of megaliths on the Falbygden plateau, Västergötland, probably also protruded over their low, two-tier mounds (Sjögren 2003).

There has also been considerable discussion in recent years relating to the experiences these sites created for people, especially in terms of what it would have been like for someone to enter a chambered tomb in prehistory. Some chambered tombs in north-west Europe were too small ever to have accommodated large numbers of people. However, there are many examples from across this area where the chambers are large enough to accommodate a number of people along with artefacts. People clearly entered the chambers to deposit and reorder material. Inside the dark north European chambers, powerful effects could have been created by a few flickering torches, dramatically lighting layers of birch bark within the walls and the burnt white flint covering the floor upon which the ancestral bones rested. Elsewhere, for example at Newgrange or at Gavrinis, the rays of a rising midwinter sun entering the chambers highlighted decorative motifs carved deeply into the stones, perhaps enabling a few members of the community to reaffirm their myths of origin and to experience the mysteries of the surrounding world. Some chambered tombs may also have been deliberately engineered to have certain acoustic properties (Watson 2001). It has been shown that particular acoustic effects can be created through quite simple means. For example, a simple drum beat in some passage graves has an acoustic effect similar to that of blowing over the top of a bottle (Watson and Keating 1999). This would have created powerful effects on those in the chamber, effects they may well have assigned to supernatural forces. In combination with other components, including distinctive rock art designs, or the careful placement of colours and textures (Cummings 2002), these effects meant that chambered tombs may well have been thought of as other-worldly places, places where the living and dead met, and as gateways to other worlds. In this sense, then, chambered tombs were not simply locations for depositing and transforming the dead, but places between the worlds of the living and the dead, creating extraordinary experiences for people engaging with them.

Megalithic builders were thus employing raw materials as a medium through which they could symbolize, in quite dramatic fashion, their myths and the powers of the supernatural. This was skilled crafting at its best, combining the technological expertise and the symbolic knowledge needed for the megaliths to function within the cosmological order of the Neolithic world.

Megalithic art

The presence of carved motifs on megalithic monuments has been recognized since the end of the seventeenth century, but the term ‘megalithic art’ only became common during the early twentieth century. Megalithic art is present throughout much of the area where megalithic chambered tombs are found. It is not restricted to chambered tombs but also occurs on standing stones, and the range of motifs overlaps with those at rock art sites in Britain, Ireland, and western Iberia (see [Fairén-Jiménez](#), this volume; [Jones et al.](#), this volume). In quantitative terms the highest concentration of megalithic art is located in the Boyne Valley of Ireland, where Knowth has over 300 decorated stones ([Eogan 1986](#)) and its neighbour Newgrange has no fewer than 85 decorated slabs ([Shee Twohig 1981](#), 100). At Knowth and Newgrange carvings are not restricted to the tomb interiors but are a particular feature of the megalithic kerbstones that edge the mounds. The motifs include concentric circles, radial motifs, nested arcs, chevrons, lozenges, and spirals. Similar motifs are found on a small number of passage graves in north Wales and at a handful of sites in Orkney, which may indicate direct connections with the Boyne area.

The megalithic art of Britain and Ireland belongs probably to the later fourth millennium BC and is essentially non-representative in character. It contrasts with the earlier tradition of carvings on Breton megalithic monuments that includes depictions of hafted stone axes and quadrupeds. Also present in Brittany is a range of more enigmatic motifs which may be representational but are hard to identify. One such motif, traditionally considered a female being or divinity, has been recently reinterpreted (controversially) as male genitals, whilst another (formerly termed an ‘axe-plough’) may represent a sperm whale ([Cassen 2000](#); [Whittle 2000](#)). Interpretation of these motifs has been revised in light of the evidence that many of the carved stones found within chambered tombs were recycled standing stones. Fallen standing stones bearing the same range of motifs are known ([L’Helgouach 1983, 1997](#)). The decorated menhirs (some of them also shaped into ‘shouldered’ anthropomorphic forms) are among the earliest Neolithic monuments in north-west France (fifth millennium

bc) and appear to have been associated with long mounds. Recycled decorated stones have also been identified at Knowth and Newgrange, though other slabs in the Boyne tombs seem to have been carved *in situ*.

Megalithic art is also found in Iberia, where again it is present both on standing stones and within chambered tombs (sometimes on slabs recycled from earlier monuments). Alongside carved motifs, Iberian megalithic art also features painted designs, notably in Galicia and northern Portugal, although recent discoveries indicate that painted art was once present throughout the peninsula ([Bueno-Ramírez and Balbín-Behrmann 2002](#)). Painted decoration was recently found in Brittany, and faint incisions interpreted as guidelines for painted motifs have also been found as far afield as Orkney, indicating that painted art may once have been considerably more widespread ([Bradley et al. 2001](#)). The megalithic art of Iberia is mainly non-representational although ‘sun’ symbols, ‘whale’ motifs, serpents, quadrupeds, and anthropomorphs are found.

The diversity of styles and subjects, and the use of recycled materials, warns against any single explanation or interpretation for megalithic art, although a connection has been suggested between some motifs and the abstract shapes seen in trance ([Lewis-Williams and Dowson 1993](#); [Lewis-Williams and Pearce 2005](#); [Dronfield 1996](#)). Other features, such as the paired female breasts in some of the later north French tombs (fourth millennium bc), may indicate beliefs of nurturing the dead whose remains lay within ([Scarre 2009](#)). In most cases, however, the significance of the art and its relationship to funerary activity and symbolism remains unclear. Proposals that the motifs found in a few of the later tombs of southern Brittany might represent human torsos are speculative and have not won widespread acceptance ([Thomas and Tilley 1993](#)).

Interring the dead and other activities at tombs

Whilst the preservation of human remains in north-west European megaliths is uneven, the chambers were clearly constructed to contain burials. In addition a range of other activities took place in the immediate vicinity of the monuments, emphasizing their role in the wider social realm of the Neolithic communities.

Natural conditions, for example the largely acidic soils in Brittany, across the North European Plain or parts of southern Scandinavia, are clearly responsible for the poor survival of human remains in those areas. In contrast, in areas with underlying geology of chalk and limestone, such as Normandy, Poitou-Charente, southern Britain, or the Falbygden plateau in west central Sweden, human remains survive

well. Such remarkable preservation enables detailed study of the various burial practices and, importantly, provides a unique insight into the lives and deaths of people in the Neolithic. Considerable osteological and interpretative work has been conducted on human remains (see [Fowler and Scarre](#), this volume) and current scientific analyses on human skeletons from burial chambers in different regions of north-west Europe are opening up further possibilities of family and kin group analyses and mobility patterns within Neolithic communities ([Sjögren](#), this volume), as well as suggesting interpretations for the selection of individuals to be buried within monuments ([Thomas et al. 2011](#)).

Whilst the general accessibility of chambers facilitated repeated use of the interior, the different patterns of deposition of human remains within the megalithic chambers demonstrate different ways of dealing with the dead. In northern Europe there was an initial emphasis on individual burials within timber chambers and early dolmens, accompanied by a stereotypical set of grave goods such as collared and/or lugged flasks, flint blades, and axes (for example the single individuals found at Kellerød or Ølstykke on Zealand; [P.O. Nielsen 1984](#)). Similar patterns have been suggested for the Atlantic façade, with individual interments in the early Breton monuments ([Boujot 1996](#); [Boujot et al. 1998](#)), although evidence from further south already suggests a practice of multiple inhumations having undergone a partial process of skeletal reduction (for example the cist graves at La Goumoizière: [Scarre 2011](#), 180).

With time there developed greater concern with the dead in their ancestral capacity and the original deposits within open chambers often involved selected fragments of human remains, although complete individuals continued to be also deposited. The latter are well documented from the passage graves in Falbygden ([Sjögren](#), this volume) and in some chambers in Germany. The presence of a six-month-old foetus (*in utero*) found at Rheine in Westfalen, suggests that at least one of the six females there must have been buried as a complete individual ([Eckert 1999](#)). Intact individual burials laid out side by side are also found in burial chambers in Normandy, notably at Condé-sur-Iffs, though different practices may have been carried out contemporaneously at other tombs in the region ([Fowler and Scarre](#), this volume).

The frequently encountered masses of largely disarticulated human remains do however, reflect different practices. Sometimes this is a result of disintegrated complete bodies having been either pushed aside or rearranged to make room for new arrivals (for example at Hazleton North; [Saville 1990](#)), whilst elsewhere such depositions clearly reflect secondary burials of fragmentary human remains

brought into chambers from elsewhere (for example in the passage grave at Liepen in Mecklenburg; [Midgley 2008](#), 126, fig. 4.11). Periodic visitations involved entering the chambers, not necessarily on occasions of further burials, and the dead became an important symbolic resource; their bones were sorted and rearranged, skulls and other body parts manipulated into piles or even removed from chambers to other locations. In this sense the idea of removing the individual identity of the deceased or of a transformation from a living person to an ancestor became part of the rites of passage ([Thomas 2000](#)).

Communication with the dead was an important aspect of social life in the Neolithic and it could have variously involved a small group of kin or a much larger group of participants. That people came to the tombs at times other than burials is shown by the intentional deposits of pottery, stone, and flint tools placed outside the chambers, along the kerb stones or within the forecourts. Goods were deposited either at the foot of the stone kerbs, in niches or on stone shelves either side of the entrance or in pits dug on such occasions. Sometimes tools and pots, which may have contained food offerings, were destroyed at the end of such ceremonies. The bones of the dead resting within the chambers—especially the skulls—may have been brought out in awesome displays, and ritual scenarios may have included festivals of the dead, vigils for the ancestors and supernatural deities; there may have been dancing, singing, feasting, recounting of myths and heroic ancestral exploits, initiations, and other activities. Moreover, such ceremonies may have provided occasions for the living to renegotiate their place in the world alongside the dead, and consider the identities of the living and the dead ([Fowler 2004](#)).

Chambered tombs and landscape

There has been a long-standing interest in the chambered tombs of north-west Europe, both in terms of their specific architectural and depositional sequences and of their wider distribution. As soon as archaeologists started creating distribution maps of chambered tombs, it was obvious that these monuments are not found in all areas of the landscape. There are notable blanks, whilst in other areas considerable numbers of chambered tombs were constructed. Early scholars thought this may be representative of the places that incoming agricultural populations settled (e.g. [Piggott 1954](#)), but subsequent considerations have addressed other possibilities. [Colin Renfrew's 1973](#) argument that chambered tombs were the centres of territories of family groups was, and still is, an extremely influential interpretation of the reason why some parts of the landscape saw

chambered tomb construction, whilst others did not.

Christopher Tilley's *A phenomenology of landscape* renewed the debate concerning the relationship between chambered tombs and the landscape (Tilley 1994). It has always been clear that monuments were part of a network of locales in the landscape, where people dwelt, made a living and commemorated their dead. What made Tilley's (1994) approach unique was his suggestion that the landscape itself, the mountains, seas, rivers, and pathways linking places, was an important component of people's belief systems. For Tilley, these landscape features were imbued with significance, tied to mythology and ancestors, and hence people built their chambered tombs in relation to these features, as illustrated by the way the monuments of south Wales were carefully positioned in relation to specific mountains, rivers, and outcrops, likely places redolent with myth and memory and with strong connections with the past (Tilley 1994, 109). The landscape was not just a backdrop to activity, but as important a part of the monument as the stones of the chambers. Tilley's early work was confined to British examples, but subsequently there have been considerations of the landscape setting of sites beyond Britain (e.g. Bergh 1995; Lopez Romero 2008; Tilley 2004).

In many areas of north-west Europe, people built their chambered tombs in very specific parts of the landscape. What this actually means, however, remains highly contested (e.g. Fleming 2005). We need to think about the relationship between these locations and earlier sites, including Mesolithic and early Neolithic occupation sites. Were people inscribing the landscape in new ways in new places, or were there strong connections with the people and places of the past? If monuments are located in specific parts of the landscape, what can those landscapes tell us about how people thought about the world? Did people have particularly strong connections with specific landscapes or places, critical for their identity? These are all important questions which can help us elicit an understanding of the connections between people and places in specific regional contexts.

CONCLUSION

Despite several centuries of enquiry, chambered tombs remain a key focus of research into the Neolithic communities of north-west Europe. New sites continue to be discovered. One may note, for example, the quite breath-taking arrangement of about 20 dolmens, aligned along a ceremonial route delimited by timber palisades and rows of standing stones, that was discovered and excavated between 2006 and 2008 at Döserygg, in south-west Scania; it is so far unique within the north

European context and requires a reappraisal of the north European tombs as solitary monuments (Andersson and Wallebom, personal communication). Another example is provided by discoveries of monumental longbarrows: some have been lost since the early decades of the nineteenth century and are now re-emerging from the depth of the forests in Western Pomerania (Matuszewska, personal communication), whilst others are being discovered in the traditionally 'non-monumental' territories of the loess plateaux of central Germany and southern Poland (Schwarz 2003; Libera and Tunia 2006), forcing revisions of both the extent of the province and the concept of monumentality.

The coming decades will doubtless provide additional insights through new avenues of research which are opening up. These include the application of new scientific techniques, such as dating methods that can be applied both to the structures themselves and to the human remains that they contain. Chronological precision—achieved by systematic use of AMS dates coupled with Bayesian analysis—has already demonstrated its potential in recent studies of southern British long mounds. Wider application of the same methodology will no doubt yield valuable insights in other regions. Other scientific techniques, with considerable potential for elucidating patterns of use of the tombs as burial places, are analyses of stable isotopes and ancient DNA. The former have already revealed how a significant proportion of the population buried in tombs in Sweden had come from a distance. It is possible that levels of Neolithic mobility have been systematically underestimated by archaeologists in the past and that wider application of stable isotope analysis will demonstrate a fluid pattern of movement, whether by individuals or groups, that will show that some tombs did far more than serve only their local community. Analysis of ancient DNA (which is gradually becoming more widely applicable) will also throw light on the composition and origin of the buried population, and may be able to identify corporate kin groups among the buried individuals.

Alongside further study of the chambered tombs themselves, better contextualization will remain a key priority. It is frequently observed that in the regions where they are common, megalithic tombs usually far outnumber settlement sites, and the character of the settlements that housed those communities who built and used the tombs demands further enquiry. Contextualization should extend also to the relationship between stone-built structures and contemporary earthen and timber constructions as well as other, often undervalued, burial practices such as those of flat graves within settlements, or adjacent cemeteries, and other unimposing contexts. The implications here for the understanding of the role of megaliths in the creation of collective

identities, the social structures, and their dynamics are significant. Finally there remains the issue of the original character of the landscapes in which these chambered tombs were situated, and whether those landscapes were forested or open, cleared and cultivated, or boulder-strewn. The popular tendency to romanticize these structures in their current condition and appearance must not cloud our awareness of the profoundly different settings in which they once stood.

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CHAPTER 44

NEOLITHIC ROCK ART IN IBERIA

SARA FAIRÉN-JIMÉNEZ

INTRODUCTION

ARCHAEOLOGISTS' appreciation of the key role played by rock art in the transformations that shaped social life in Neolithic Europe has increased significantly over the last decades. In few places has this been more noticeable than in the Iberian Peninsula. The inception and development of Neolithic communities in this area was accompanied by the emergence of a wide range of rock art styles, which featured different distributions, techniques and contexts of use (Fig. 44.1). The Neolithic rock art in Iberia is characterized by its diversity: although one of its unifying characteristics is its frequent open-air character, other attributes vary between, and even within, different geographic areas.

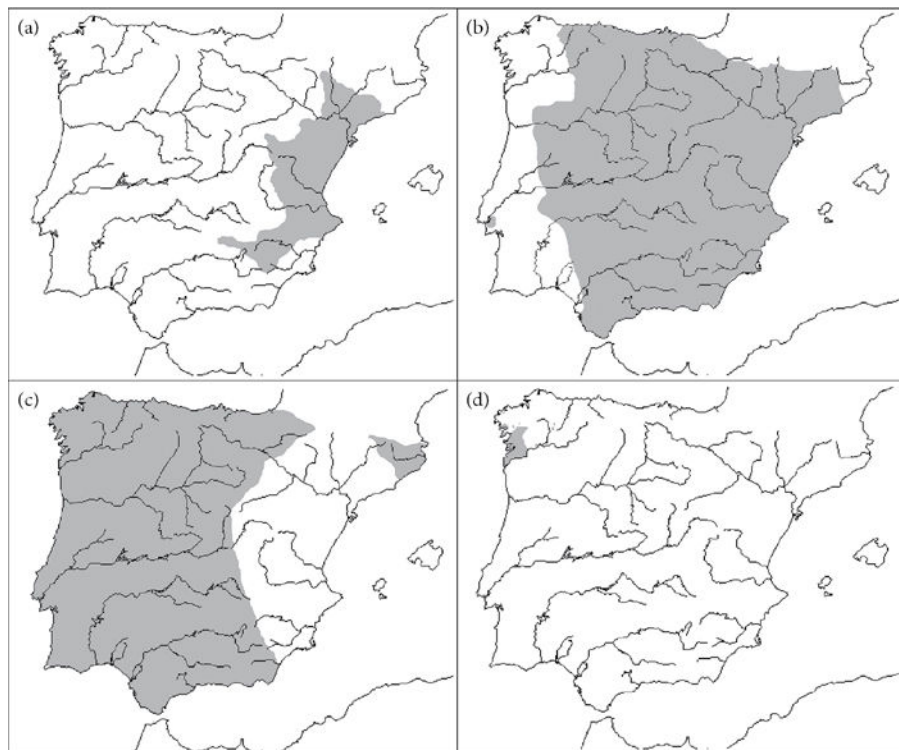


FIG. 44.1. Neolithic rock art styles in the Iberian Peninsula. A) Levantine; B) Schematic; C) Megalithic; D) Galician-Atlantic.

As a general rule, we can say that whilst rock art in the Mediterranean area (e.g. the Levantine style) is most frequently painted in open-air rock-shelters, in the Atlantic the typical occurrence is carved outcrops (e.g. the Galician-Atlantic style). Other styles, however, are not clear-cut in their definition: for instance, schematic rock art has a widespread distribution throughout the whole of the Peninsula, it can be either painted or carved, and it can be found both in open-air locations and inside caves. Moreover, some of the schematic motifs also appear in association with megalithic monuments (tombs and standing stones), or in material culture belonging to the megalithic symbolic world (freestanding statues and *stelae*, decorated ceramics, etc.). The context in which each motif was deployed is paramount in allocating it to one style or another. Some authors favour the treatment of these similar designs under the all-encompassing label of ‘megalithic art’ regardless of whether they are located at megalithic monuments or elsewhere (Bueno and Balbín 2000, 2002; Bueno et al. 2004). However, others have argued that this approach ignores the implications that different locations have for the physical and social context of the designs (Bradley 2002). Both positions raise interesting points: whilst the repetition of similar

designs in different media and contexts might indicate an intentional reinforcement of the messages that art was intended to transmit in diverse spheres of activity, it is also clear that the analysis of this variability offers richer opportunities for archaeological interpretation. The variation in the context in which rock art was to be seen can indicate differences in its past uses, and also in the size and character of the audience that could have accessed it at any one time. This analysis can be done at two different scales: attending to the distribution of designs within a panel, site, or monument; and attending to the topographic location of sites in the landscape. The placement of the designs is also important in that their archaeological and landscape associations can give us hints about the potential uses served by Neolithic rock art. In the case of megalithic art, the funerary connotations of these designs is clear when they are deployed in dolmens and passage graves, but this is more difficult to establish when those designs appear in association with menhirs (which have an open-air context). Similarly, for those motifs deployed in rock-shelters and outcrops, the identification of the context in which they were created and used is more difficult to grasp and always requires looking beyond the panels. In these cases, their archaeological and geographical context is crucial for understanding the sort of practices that they were originally associated with.

This contribution examines similarities and differences between rock art at megalithic sites and open-air rock art of Neolithic Iberia—painted and carved designs that appear in rock-shelters, cliffs, and outcrops. The stylistic overlaps and cross-references between the different art styles that emerged during this period will be discussed, whilst also exploring the variability appreciable in their content, topographic location and archaeological context.

STYLES

Levantine

The naturalistic, dynamic, and stylized character of Levantine paintings sets them apart from the other Iberian Neolithic rock art styles. This style is characterized by detailed and naturalistic hunting compositions, where (allegedly) male individuals armed with bows and arrows track or hunt wild animals, as well as by scenes representing diverse gathering activities. Also typical, although less frequent, are scenes with archers marching or in confrontation with other groups of archers, isolated groups of animals, or human figures

engaged in what traditionally have been considered ritual ‘dances’. Animal figures (especially cervids, wild caprids, and bovids) play leading roles in the hunting scenes and, although they are frequently wounded, very few of them are actually represented dead but in static standing positions. Human figures are also the focus of attention. Very few of them show obvious sexual attributes, and yet they have customarily been considered male representations, leading to proposals that Levantine art reflects a politico-ideological strategy of concealment of the social role of women in Iberian Neolithic communities (Escoriza 2002). The apparent lack of interest in representing sexual attributes of both women and men contrasts with the attention paid to material culture: bows, arrows, quivers, baskets, and ornaments (bracelets, ribbons, feather headdresses, etc.) are often represented with great detail. Although this apparent contradiction could raise interesting questions regarding the way in which the authors of the paintings expressed their identity, the subject has not been explored to any extent. This is probably due to the still unsolved issues regarding the chronological and cultural attribution of the Levantine style.

Indeed, the chronology of Levantine paintings has been disputed since the first discoveries in the late nineteenth century, and even today the debate remains open. Originally, this style took its name from the distribution of the first sites discovered throughout eastern, or ‘Levantine’, Spain. In fact, the name was proposed by Henri Breuil in order to differentiate this style from the Cantabrian Palaeolithic cave art, as he considered that the two of them had the same Palaeolithic chronology. However, this classification turned out to be wrong. On the one hand, subsequent discoveries indicated a much wider area of distribution (towards the interior of the Peninsula, in areas far away from the coast such as the mountains of the Pre-Pyrenees in Huesca, or the *sierras* of Cuenca and Jaén). On the other hand, its chronology is now accepted to be at least Neolithic, if not more recent. The chronological debate, however, is far from closed, mainly because of the so far unsuccessful attempts to obtain radiocarbon dates from the paintings. A recent study (Ruiz et al. 2006) has tried to date the oxalate crusts that cover the paintings, but their results are not conclusive: in the best of cases, they can only provide an indirect estimation of the age of the paintings that either underlie or cover these accretions.¹ As a consequence, the chronological debate still relies on indirect evidence: the identification of the material culture depicted; superimpositions with motifs belonging to other Neolithic styles (Fig. 44.2); and similarities with designs that also occur on Neolithic decorated ceramics and other portable objects. These arguments are not conclusive, which allows for the current

polarization of the debate: some authors take the images literally, suggesting that they were carried out by hunter-gatherer groups who maintained a Mesolithic way of life, although within the time frame of the local Neolithic (Alonso 2002). Other authors, however, have suggested that these scenes have a metaphorical dimension, as they were created by genuine agricultural communities (Hernández and Martí 2000–01; García et al. 2003; Fairén 2004).



FIG. 44.2. Levantine paintings over macro-schematic at La Sarga (Alcoi, Spain).

Accepting the validity of the Neolithic attribution despite the relative uncertainty of the chronological arguments, recent studies on Levantine paintings have concentrated on patterns of distribution in the landscape and the wider archaeological context in which the rock art sites were created and used. Ever since the earliest discoveries it was noted that Levantine paintings were preferentially located at shallow rock-shelters, distributed along the hillsides of narrow valleys and gullies, and overlooking rivers or small streams. Recent Geographic Information Systems (GIS) analyses of these sites have confirmed these patterns, which suggest the articulation and economic exploitation of the landscape by communities with an important degree of mobility (Fairén 2004; Cruz Berrocal 2005). These analyses have also revealed differences in the patterns of location between the larger and more accessible rock-shelters (such as the well known *Minateda*, *Cantos de la Visera*, *La Sarga*, and *Cogul*, among many

others), and the smaller ones, which are usually scattered around the main sites, or isolated in more remote locations. The differences between these types of locales extend to the content of the scenes, with the larger sites deploying more complex compositions. Ultimately, these differences have been attributed to the different roles that these sites served: the smaller sites, placed in more secluded locations, seem to have had a higher economic potential than the bigger ones, whose use seems to have been related to gatherings of ample audiences ([Fairén 2004](#); [Fairén-Jiménez 2007](#)).

Schematic

Schematic Art is difficult to characterize. For many years, this label has been treated as a catch-all term for any representations with a heavily stylized character which could not be clearly ascribed to any other style. As a consequence, designs labelled as ‘schematic’ have an extensive distribution across time and space: they may range from the early Neolithic to the Bronze and Iron Age and they can be found across most of the Iberian Peninsula (although a significant vacuum has been noted in the north-western area) and beyond (southern France, Italy, and some Mediterranean islands). However, for the purposes of research it has been conventionally accepted that there is a distinct and coherent, regional variant of the schematic tradition in the Iberian Peninsula that spans the Neolithic and Copper Age. The definition of this style follows, with the necessary updates and modifications, the proposals of [Pilar Acosta \(1968\)](#), which in turn revised Henri Breuil’s research during the early twentieth century ([Breuil and Burkitt 1929](#); Breuil 1933–35). Acosta’s typology grouped the commoner designs within this style, despite the variability in forms and techniques that characterizes the schematic repertoire. These designs include human and animal figures, representations of the sun, *occuli* and idols, plus a wide range of non-figurative, geometric designs (dots, bars, zigzags). These motifs are characterized by the simplification of the figures to minimal outlines, their reduced size, and the scarcity of scenes and compositions ([Fig. 44.3](#)).

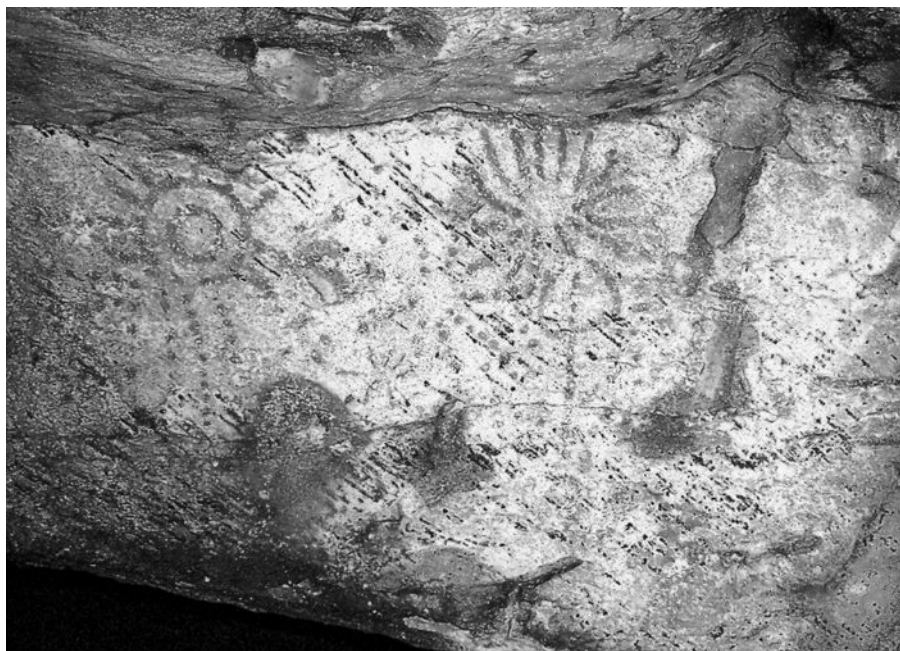


FIG. 44.3. Schematic paintings at Pala Pinta, Alijó, Portugal.

(Photo: Lara Bacelar Alves).

Acosta's influential classification is still used by most researchers, although nowadays her terminology, which identified designs as certain animals or objects, tends to be substituted by descriptive denominations rather than interpretive ones (Chapa 2000). Many of Acosta's other suggestions have been confirmed by recent research. For instance, although her investigations were focused on painted designs, it is now accepted that carvings were just as important in this style. Also, it is increasingly evident that these designs are not just to be found in open-air rock-shelters, but in a range of different settings including flat outcrops, vertical cliffs, and even caves that are not reached by natural light, such as: *El Pedroso*, in Zamora; *Atapuerca*, in Burgos, and; *La Pileta*, *Nerja* and others, in Andalucía (Bradley et al. 2005; Gómez-Barrera 2006; Márquez and Sanchidrián 2005). Indeed, the contexts in which schematic art is found and the technique of execution display significant regional variation: in the Mediterranean and southern areas designs are normally painted in rock-shelters (Hernández et al. 1988; Martínez García 1998), but in Andalucía the same designs have also been found in a number of subterranean caves (Márquez and Sanchidrián 2005). In other areas, such as Portugal and the northern Spanish Meseta, both painting and carving are used, sometimes in the same sites, and designs can be found in outcrops, cliffs, rock-shelters, and caves (Alves 2002; Silva and Alves 2005;

Collado and García 2009; Gómez-Barrera 2006). Finally, as we will see later, some of these designs appear in sites that yield evidences of funerary use. Overall, schematic art appears in the widest range of contexts of all the Iberian Neolithic art styles, suggesting that these designs served different roles in different areas.

The chronology of schematic art is mostly based on indirect evidence. The only exception to this are the radiocarbon dates obtained from charcoal paintings in some Andalusian subterranean caves. A painting at *La Pileta* cave yielded a date of 2394–1795 BC, which relates it to Copper Age materials found in the site (Sanchidrián et al. 2001, 17). This is coherent with the archaeological context of other schematic paintings found in Andalusian subterranean caves (Márquez and Sanchidrián 2005). However, schematic art has a long time-span. Acosta, following Breuil, proposed a late Neolithic/Copper Age chronology for this style, which she linked to the emergence of metallurgy in Iberia. Her proposal was based upon parallels with Copper Age ceramics (such as those from *Los Millares*) and the idols that characterize burial paraphernalia during this period (Acosta 1984). Current evidence, however, indicates a broader chronological framework. Since the 1980s, schematic designs have also been identified on Cardial impressed ware, on late Neolithic ceramic styles (incised and painted), and even on Bell Beakers. These parallels indicate that although schematic art was being represented from the very beginning of the Neolithic period, it remained in use and updated its repertoire during the Copper Age (Carrasco and Pastor 1980; Marcos 1980–81; Martí and Hernández 1988; Torregrosa and Galiana 2001). This chronology varies within the Iberian Peninsula, as in some regions the style seems to have been adopted earlier than in others. Moreover, its repertoire did not remain stable throughout this period. Parallels with portable objects seem to indicate that motifs such as zigzags, animals, human figures, and representations of the sun were in use from early times, whereas the imagery related to objects belonging to the funerary world (*occuli*, idols) only started to be deployed during the Copper Age.

The archaeological associations of this style also varied throughout the Neolithic and Copper Age, although this may be partly due to the variability in the settings in which schematic art was deployed. Although these designs were sometimes placed in conspicuous locations, overlooking paths and major axes of movement, most of the sites are found in remote and inaccessible locations at a distance from contemporary settlements. Although some sites could accommodate large numbers of visitors, others seem to have had a very restricted audience (Alves 2002; Bradley 2002). Moreover, most of the smallest sites were located in remote and inconspicuous locations;

consequently, it has been proposed that their location would only be noticed if it was previously known, and that these sites were only visited in association with particular social practices that had to take place there (Fairén-Jiménez 2007, 135).

A special variation within the schematic style, called macro-schematic due to the large size of the paintings (Hernández et al. 1988), was identified during the late 1980s and is demonstrably a coherent sub-group of schematic art. Unlike other schematic art, macro-schematic representations only include anthropomorphic figures and geometric designs, surrounded by curvilinear parallel lines and clusters of dots. Most of the anthropomorphic figures are represented with raised arms and outspread fingers, horns and other unusual features such as radial motifs emanating from what are considered to be 'heads'. Parallels with decorated ceramics indicate a short early Neolithic lifespan for these paintings. As for their geographic distribution, although initially it was considered to be restricted to the central Mediterranean coastal area, in the past few years new sites have been found in the surrounding areas of Murcia, Valencia, and Cuenca. At many sites in these regions, macro-schematic designs were painted under Levantine ones and were surrounded by schematic figures (see Fig. 44.2 for an example of macro-schematic paintings covered by Levantine stags). This confirms their earlier chronology in relation with other art styles.

Megalithic

Megalithic art is difficult to characterize, for in this case the style is not defined by its imagery (which changes from area to area, and frequently overlaps with schematic designs), but by the contexts in which it is found (Bradley 2002, 232). Therefore, a strict definition of megalithic art would comprise those designs that appear associated either with megalithic monuments (dolmens, passage graves, menhirs), or with artefacts belonging to this world (statues, *stelae*, decorated ceramics). Although megalithic monuments sometimes re-use previously carved boulders and slabs, which originally featured in open-air landscapes (Bradley 1997, 58ff; Bueno et al. 2007, among others), in most cases the designs were clearly made after the erection of the monuments (see Bueno et al. 2007, 596 for a selection of examples where this is the case).

The style encompasses both geometric motifs such as cup-marks, meanders, zigzags, and concentric circles, and figurative motifs such as representations of the sun, *occuli*, animals (snakes and quadrupeds), and human figures. Representations of human bodies occur as explicit depictions and as implied by the forms of statues, *stelae*, menhirs, and

even individual orthostats within monuments (Fig. 44.4). Painted or carved motifs of human figures often appear in association with quadrupeds and representations of the sun in what have been interpreted as scenes of ritual hunt (Bueno and Balbín 2000, 442). Despite earlier views that megalithic art in the Iberian Peninsula was mostly painted, with carvings being a marginal expression (Shee Twohig 1981), it is now accepted that these designs can be painted, carved, or pecked. Not only are these techniques contemporary, but in certain figures they were used simultaneously (Bueno and Balbín 2000; Carrera and Fábregas 2006).



FIG. 44.4. Megalithic paintings at Antelas, Oliveira de Frades, Portugal.

(Photo: Lara Bacelar Alves).

Until recently, the chronology of megalithic art has been based on indirect evidence (stratigraphic and stylistic). It was assumed that the oldest representations were contemporary with the building of the first monuments, and that they remained in use until at least the third

millennium BC. Recent radiocarbon dates obtained from the black pigments that decorate some monuments in the north-west have permitted refining this temporal framework. A panel from a passage grave in Antelas, Viseu, Portugal yielded a date of 4655 ± 65 BP (Cruz 1995). Steelman et al. (2005; see also Carrera and Fábregas 2006) have dated both charcoal from megalithic paintings and samples from the related archaeological deposits. Their results range between 5300 and 2130 BC, which is consistent with published dates for monument construction and early activity at megaliths in the north-west (Steelman et al. 2005, 386).

Megalithic art has been identified in dolmens and passage graves across most of the Peninsula, with the exception of the central Mediterranean area. These designs appear on orthostats along the passage and in the chamber of megalithic tombs, although their distribution within the monument seems to follow certain rules: whereas the simplest motifs such as cups occupy the most accessible areas of the entrance, figurative designs (especially human representations) tend to concentrate in the deepest part of the monument, especially the rear wall of the chamber (Alves 2002, 61; Bradley 2002, 233). As for their distribution in the landscape, it has been noted that megalithic monuments tend to be placed in highland plateaus, circular basins, and the bottom of minor river valleys (Alves 2002). These locations are often close to agricultural lands, and thus the monuments are often interpreted as territorial markers (Bueno et al. 2004).

Galician-Atlantic

The petroglyph tradition of north-western Iberia consists entirely of rock carvings on flat outcrops. They have frequently been linked with the cup-and-ring tradition widely found in Britain and Ireland. However, along with the geometric designs that form the basis of the Atlantic imagery (cup marks, grooves, concentric rings, spirals, and labyrinths), the defining element of Atlantic carvings is the representation of figurative motifs: mostly antlered stags (Fig. 44.5), but also, though in smaller numbers, horses, human figures, and artefacts (especially weapons) (Peña and Rey 1997). Despite its name, this tradition is not restricted to the Galician region, for some examples have been found in the coastal area of northern Portugal—the so-called Group I in Baptista's classification (1983–84; see also Bradley and Fábregas 1998).



FIG. 44.5. Os Carballos, Campo Lameiro, Spain.

The chronology of these designs has been discussed for over a century without any direct dates. Currently the debate is polarized between two opposing proposals. On the one hand, followers of the traditional view favour a short chronology (third millennium BC–early second millennium BC). These researchers argue that the tradition emerged during the Copper Age concurrently with the introduction of metallurgy (as indicated by the depiction of certain weaponry, such as halberds and daggers), although it may have remained in use during the early Bronze Age (Peña and Vázquez 1979; Peña and Rey 1997; Peña 2003). On the other hand, some researchers argue for a longer chronological span, with the earliest carvings (cups) dating back to the late Neolithic (fourth millennium BC), but with the majority of carvings produced throughout the Bronze and Iron Age (Criado and Santos 2006). This long time-span, which has not been readily accepted by many researchers, is based on the depiction of horse riding scenes and labyrinths, as well as stratigraphic evidence obtained during the excavation of rock panels in Campo Lameiro (but see Santos 2005a). But even if this late chronology is not accepted, it is interesting to note that the history of Atlantic carvings overlaps with that of schematic and megalithic art. Similarities, however, end here: geographically, this style is distributed across an area where schematic art is not present; and in stylistic terms its content is quite distinct from megalithic art.

Their location also sets this tradition apart from others. These carvings were generally created on flat or gently sloping outcrops and boulders, never particularly conspicuous within the landscape. They were often located close to paths running along the edge of *brañas*, natural basins which remain relatively moist even at the height of summer, and therefore concentrate the main productive resources. As such, the carvings seem to have been closely integrated in the pattern of movement of wild animals (stags, horses) between basins and around the landscape (Bradley et al. 1994; Santos 1998). It has been pointed out that this pattern seems to emphasize the importance of mobility long after the adoption of domesticated resources—a key aspect of this art, considering that it is located in areas best suited to exploitation by hunting, mobile pastoralism, or shifting agriculture (Bradley et al. 1994, 375).

CONCURRENCES AND VARIABILITY: ART IN THE LANDSCAPE AND OTHER CONTEXTS OF USE

So far we have seen similarities but also differences in the stylistic content, chronology and broad geographical and topographical distribution of the different Neolithic art styles in Iberia. Whilst some of them show distinct stylistic characteristics (e.g. Levantine and Galician-Atlantic imagery), there are also significant overlaps and cross-references between them. As well as representations of the sun and *oculi* appearing in both schematic and megalithic art (among other motifs; see below), cups and concentric rings can be found in both the Galician-Atlantic and megalithic imagery. In the later case, it could be tempting to attribute the concurrence to the re-use of Galician-Atlantic panels in later megalithic monuments. However, this explanation is obviously flawed as the Galician-Atlantic style has a very restricted geographical distribution, whereas megalithic art can be found across most of the Peninsula. Schematic and Levantine paintings also show complementary distributions both at a macro level (location of sites in the landscape) and at a micro level (organization of motifs within the panels at a rock-shelter). For instance, in the Mediterranean area it is relatively common to find both styles using different rock-shelters within what is considered to be a single site (a grouping of shelters). When schematic and Levantine paintings share the same panel, it is frequent that those panels that contain more complex Levantine compositions have scarce schematic designs, and vice versa. In some of the panels where both styles occur together, schematic figures tend to copy attributes from Levantine art—for instance, schematic human figures armed with bows and arrows

(Fairén-Jiménez 2006, 144). Finally, further stylistic cross-references can be found in the scenes of ritual capture of stags where the animal is tied with rope and kept alive, rather than shot with arrows. Although these scenes are not very frequent, they are present in all four styles: Levantine (for instance in *Muriecho*, Huesca: Ayuso et al. 2000), schematic (*Mallata*, Huesca: Utrilla and Martínez Bea 2005), megalithic (*Orca dos Juncais*, Viseu: Shee Twohig 1981), and Galician-Atlantic (*Os Carballos*, Pontevedra: Santos 2005b).

However, stylistic overlaps are most noticeable between the schematic and megalithic art: both styles share techniques (paintings and carvings) and imagery (geometric designs, human figures, representations of the sun, *occuli*). Based on this evidence, Bueno and Balbín (2000, 2002) argue that this art should be treated as a single tradition. Schematic and megalithic paintings are commonly found at caves and rock-shelters that were used as funerary deposits during the Late Neolithic and Copper Age in Alicante and Murcia. In both these regions megalithic tombs are absent. Bueno and Balbín (2002, 621) argue that the same funerary ideology was expressed at the caves and rock-shelters and the megalithic tombs. However, the funerary associations of schematic paintings have also been noted in areas where megalithic tombs are common, such as in Extremadura and Andalucía. Indeed, most of the subterranean caves in Andalucía where schematic paintings have been documented also yielded evidences of burials (Márquez and Sanchidrián 2005). This demonstrates the versatility of the schematic imagery, where similar designs convey very different messages depending on the context in which they were deployed: these designs were used both in open-air landscapes and inside caves; some of the sites were readily accessible to large audiences, whereas others could only be entered by a few people at a time; and, finally, whilst some of these sites seem to have been devoted to activities related to the living (economic practices and social gatherings), others were addressed mainly to the dead. This variability may be partly due to chronological differences. Indeed, it is easy to appreciate a changing tendency from the visibility of the sites that marked the landscape during the early Neolithic to the more secluded deployment of rock art during the late Neolithic and Copper Age. The development of the funerary dimension of schematic rock art during this period would only confirm this trend. However, this is just a part of the picture, as the specialized character of schematic art sites was present since the beginnings.

From this point of view, if we attend to the context in which each style was deployed, we can appreciate important divergences that undermine Bueno and Balbín's proposal. Whilst schematic designs are sometimes found inside caves that do not receive natural light and

impose restrictions to the circulation of people—much like the interior of megalithic tombs—the vast majority of them are found in open-air locations. Similarly, only a few schematic art sites are associated with Copper Age burials. It seems clear therefore that, if we attend to the landscape setting and the immediate archaeological contexts of schematic art sites, only a small number of them can be equated in character to megalithic monuments. All in all, schematic sites serve other, different roles beside this.

The location of many of the small open-air schematic sites inside narrow valleys, or close to mountain tracks and passes, is a feature shared with many Levantine sites. All these sites are relatively accessible and command good views over their surrounding landscape (see [Fairén 2004](#) and 2007 for a more detailed examination). Variability in the size and location of all these open-air sites indicates that they had different specializations, and not all of them follow this pattern. For instance, the largest sites are always also the most accessible, and are located by main axes of movement—the natural corridors that connect the Mediterranean coast with areas of the inner Peninsula. They also contain more complex compositions and multiple superimpositions, which indicate that the panels were re-used and modified repeatedly, perhaps by different authors. In contrast, some schematic art sites show a preference for remote and isolated locations: most frequently, high elevations that command extensive views around the surrounding territory and main areas of settlement and movement. The limited space available at those sites indicates that they could only be visited by small audiences (one or two persons at a time). Consequently, it could be said that in those cases the author and the audience of the representations had to be one and the same. The remoteness and invisibility of these sites adds a dimension of secrecy to the viewing of the images, which might be associated with rites of passage—as mentioned before, their location had to be known beforehand. But it can also be argued that in these cases the importance of the paintings resided in their making, and images were not intended to be revisited afterwards at all.

All in all, this variability indicates that there is an important degree of specialization in the uses served by schematic art sites, which would be overlooked if Schematic art were included within the sphere of the megalithic phenomenon. Furthermore, although both styles can be widely found across most of the Peninsula, in some areas they seem to avoid each other: this is the case in the north-west (Galicia), where megalithic art abounds but there are no schematic art open-air sites; or in the central Mediterranean area, where there are no megaliths but painted schematic rock shelters are plentiful. Finally, parallels on decorated ceramics (mainly Cardial impressed ware) indicate that

schematic imagery was in use from the very beginning of the Neolithic period, but, as schematic imagery is also present on Bell Beakers, it also continued to be made in open-air sites for some time after the building of megalithic tombs had lapsed. This chronological range is broader than that of the megalithic phenomenon.

CONCLUSIONS

This chapter has examined the current position of research on rock art in the Iberian Peninsula. In the past decades great advances have been made with regard to the catalogue of sites known, the definition of their archaeological contexts and chronologies, and the analysis of their roles within society and in the landscape. Advances in rock art research have been so remarkable that this is no longer considered a separate or marginal field of research, but a source of evidence indispensable to understanding the Neolithic world. However, much work remains to be done, especially in redefining the concept of ‘schematic art’ and investigating the relationships between the different contemporary styles. At the same time, it is necessary to continue working on the identification of clear patterns in the archaeological and geographical contexts of rock art production at different scales. In addition to their regional variability, the emergence of the different Neolithic art styles in the Iberian Peninsula is part of a phenomenon that encompassed a broader macro-region. A broader perspective needs to be adopted if we are to understand how the emergence and development of Iberian rock art was related to transformations shared throughout Neolithic Europe.

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NOTE

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1. These analyses form part of a wider project that also uses micro-Raman spectroscopy to study the pigment composition and microstratigraphy of several painted sites in the Serranía de Cuenca ([Hernanz et al. 2008](#)), with interesting and promising results. Similar analyses using a portable energy dispersive X-ray fluorescence (EDXRF) spectrometer have been carried out in other Levantine sites ([Roldán et al. 2010](#)).

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CHAPTER 45

THE ROCK ART TRADITION OF VALCAMONICA–VALTELLINA DURING THE NEOLITHIC PERIOD*

ANGELO EUGENIO FOSSATI

IN the Alpine region, rock engravings and paintings have been produced on the walls of rock shelters and on the surfaces of erratic boulders or bedrocks as early as the end of the Upper Paleolithic. In particular the numerous engravings, realized by hammering, scratching, or polishing the rocks, are very varied: isolated or in scenes they can be abstract or geometric, figurative, symbolic or narrative ([Arcà and Fossati 1995](#)).

Of these rock art traditions, two are the most important in terms of quantity, quality, and chronological range: that of Mont Bego (Valleé des Merveilles and Fontanalba, France) to the west ([De Lumley 1995](#)), and that of Valcamonica and Valtellina in the central-eastern Italian Alps, which is the focus of this chapter. Besides these two focal points, other smaller areas with petroglyphs or pictographs exist. Sites with rock art and/or statue-menhir groups of Neolithic tradition ([Casini et al. 1995](#)) are known, from west to east, in the Swiss Valais around Sion and in Valle d'Aosta, Italy, and in Val Susa and Val Pellice (Italy, where there are also painted figures from rock shelters). In Trentino-Alto Adige and Lessinia (Veneto, Italy), only statue menhirs are so far known. Finally, in the Graubünden Canton (Switzerland), and reaching into the Friuli-Venezia Giulia region of Italy, there is only rock art. In these areas, during the most ancient phases (fifth to fourth millennium BC), it is possible to find non-figurative rock art, such as meanders, spirals, and topographic figures, whilst in the third millennium BC the phenomenon of the statue-menhirs appears, comprising figures that we see also on carved rocks, such as weapons, ornaments, ploughing scenes, solar circles, etc. ([Fossati 2003](#); [Arcà and Fossati 1995](#)).

DATING THE ART

In the Valcamonica–Valtellina area, prehistoric rock art dates from the end of Palaeolithic to the arrival of the Romans (Anati 1976; De Marinis 1988; Fossati 1991, 2009). Obviously the rock art tradition does not always assume the same meaning for the populations that produced it, but in every period the significance of carving rock art appears to be different. The art is generally dated by the depiction of characteristic artefacts or by comparison with well-dated art in other areas, whilst superimpositions provide useful relative dating information. The most ancient period is represented by very few figures—only ten have been recognized so far and all depict animals, especially elks and deer (Anati 1974). This phase is connected to the style and chronology of open-air Ice Age art (Abreu et al. 1995, 1998; Zilhão 1997). The figures are outlined in contour and reach dimensions of up to 1m, bigger than the standard size of the zoomorphic figures of the later periods, which reach 20–30cm at most.

Emmanuel Anati divided the rock art traditions into four main different styles, termed Camunnian (i.e. ‘of Valcamonica’). The Neolithic rock art tradition comprises the first and second Camunnian styles and dates to between the first half of the fifth millennium BC and the end of the third millennium BC (including the Copper Age, in certain areas called final Neolithic). However, the dating of some motifs remains disputed. For instance, the frequent schematic anthropomorphic ‘praying figures’ (*oranti* in Italian) have been dated to the Neolithic by Anati and his followers (Sansoni and Gavaldo 2009) on the basis that they reflect what these authors termed ‘a Neolithic conception of society’ (for example there are many female figures in comparison with the successive periods). However, as De Marinis (1994b), Ferrario (1994), and Arcà (2001) have convincingly established, these chronological ideas are not supported by the study of the superimpositions between the figures: the overlaps in fact show that the praying anthropomorphs always cover spirals, topographic figures, ploughing scenes, and Bell Beaker or early Bronze Age daggers, which indicates that these figures are from the Bronze Age.

The third phase of the rock art of Valtellina and Valcamonica (the third B-C-D Camunnian style) is generally attributed to the Bronze Age (2200–900 BC). During this period, the Valcamonica area is included in the Polada culture (early Bronze Age) and subsequently, during the middle Bronze Age, in the Terramare-Benacense culture (De Marinis 1988). The Bronze Age engravings are certainly the least well studied. During the early Bronze Age most of the figures show weapons (axes, daggers, halberds), and these themes continue into the later periods (with the disappearance of the halberds and the addition of spears) (Fossati 2001b; Casini and Fossati 2007). From the middle Bronze Age

onwards the schematic *oranti* appear. They are often of female sex, indicated with a small pecked circle in the middle of the legs, and sometimes are associated with shovels similar to objects used to work with fire (to cook or to remove ashes), often found in female tombs in contemporary cemeteries in northern Italy (Fossati 2008). The final Bronze Age anticipates the most common themes of the Iron Age rock art: ‘praying’ figures, parading warriors, duellists, and hunting scenes. The engravings of the Iron Age represent the majority of the rock art tradition, probably 80% of the total (Fossati 1991). Rock art continues to be created until the arrival of the Romans in 16 BC (Fossati 1991). People returned to the rocky areas in medieval times to engrave Christian symbols: crosses, keys, shears, Solomon’s knots (a cabalistic design of a knot without end to the cords), warriors, castles, and dates and inscriptions (Anati 1976; Sansoni 1993).

Judging from the types of weapons represented, the carvings in the Mont Bego area date from the Chalcolithic to the early Bronze Age, that is from 3300 to 1600 BC (Arcà 2011). Carved daggers with short triangular blades and rectilinear bases evoke the daggers of the Remedello culture in Lombardy. Halberds with elongated blades are similar to those of the Villafranca culture. Axes with splayed distal extremities are comparable to Chalcolithic axes. Several carved axes in the Merveilles sector are comparable to the axe of the ‘Iceman’ found on the Similaun glacier and dated to around 3300 BC (see Fig. 45.2). Other daggers with elongated triangular blades evoke those of early Bronze Age cultures such as the Polada in Lombardy and the Rhodanian in southern France.

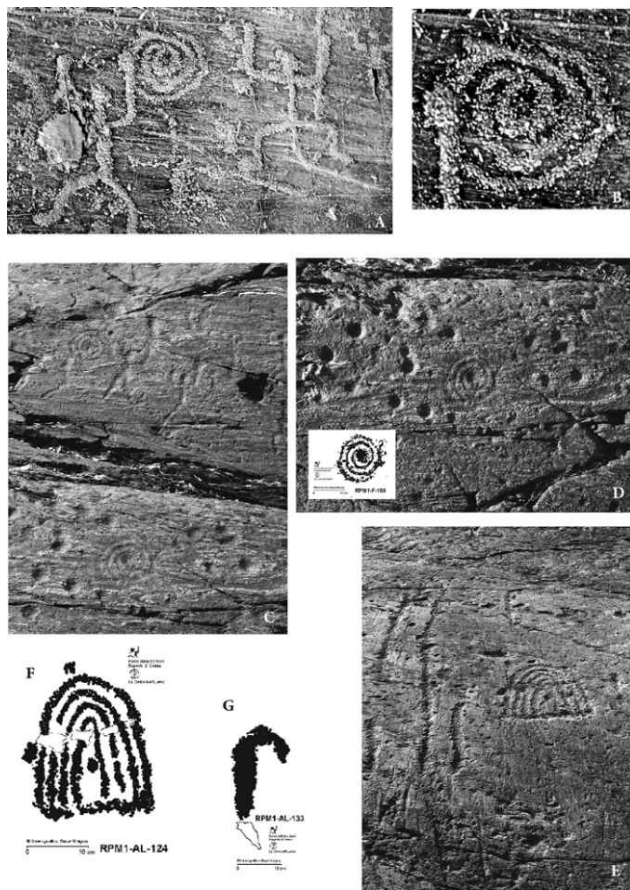


FIG. 45.1. (a) Spiral overlain by a schematic human figure. In Valle rock 4, Paspardo, Valcamonica (photo by A. Fossati). (b) Detail of [figure 45.1A](#) (photo by A. Fossati). (c) Spiral, human figures, and cup marks on the Rupe Magna di Grosio, Valtellina (photo by A. Fossati). (d) Spiral and cup marks on the Rupe Magna di Grosio, Valtellina, sector F (photo by A. Fossati, drawing by Le Orme dell'Uomo). (e) Upside-down U-shaped figures and crosses on the Rupe Magna di Grosio, Valtellina, sector AL (photo by A. Fossati). (f) Upside-down U-shaped figures on the Rupe Magna di Grosio, Valtellina, sector AL (drawing by Le Orme dell'Uomo). (g) Figure of cross on the Rupe Magna di Grosio, Valtellina, sector AL.

(Drawing by Le Orme dell'Uomo).

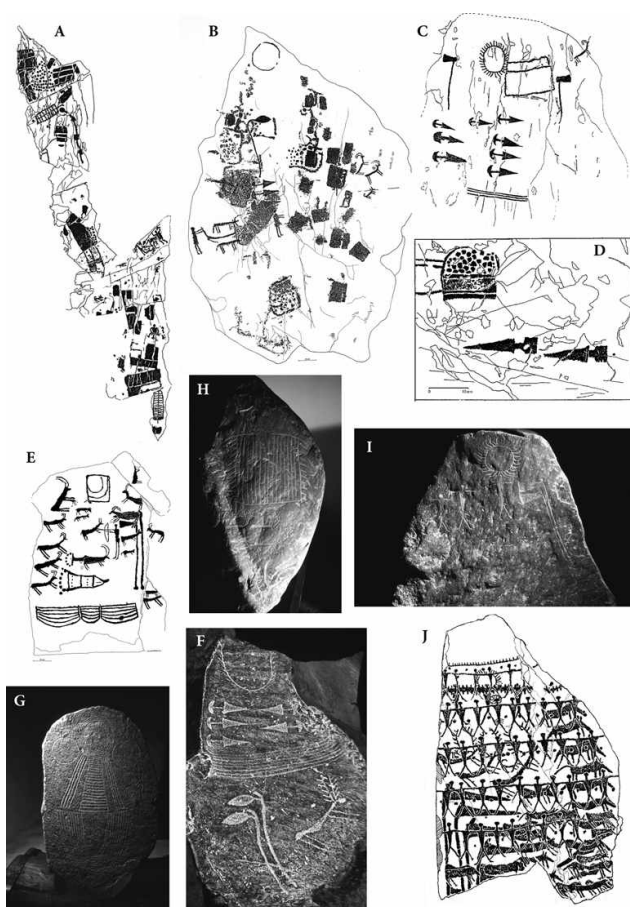


FIG. 45.2. (a) Rock 64 of Vite-Deria, Paspardo, Valcamonica, with many different types of topographic representations.

(Drawing by Le Orme dell'Uomo).

(b) Boulder Borno 1, Valcamonica, with superimpositions of Remedello daggers and topographic representations.

(Drawing by A. Fossati and P. Frontini).

(c) The stela-menhir Bagnolo 1, Valcamonica, with superimpositions of a topographic representation and the sun motif.

(Drawing by A. Arcà, S. Casini and A. Fossati).

(d) Topographic representations and Tecelंगा-type daggers on rock 36 of Vite-Deria, Paspardo, Valcamonica.

(Drawing by Le Orme dell'Uomo).

(e) The stela-menhir of Tirano-Lovero, Valtellina, with Remedello daggers.

(Drawing by S. Casini, A. Fossati and P. Frontini).

(f) The composition called 'Capitello dei due Pini' with Remedello daggers and

deer at Plas, Paspardo, Valcamonica.

(Photo by A. Fossati).

(g) Female statue-menhir found at Caven, Valtellina.

(Photo by A. Fossati).

(h) The statue-menhir Ossimo 5, Valcamonica, with the representation of a cloak and deer.

(Photo by A. Fossati).

(i) The three personages on the Ossimo 9 stela, Valcamonica.

(Photo by A. Fossati).

(j) Cemmo 3, a typical stela of phase 3rd A3 in Valcamonica.

(Drawing by R. De Marinis and A. Fossati).

THE NEOLITHIC AND CHALCOLITHIC ART OF VALCAMONICA–VALTELLINA

Today, the rock art tradition of Valcamonica–Valtellina comprises about 300,000 engraved figures—a hypothetical estimate based on the more than 2,000 rocks with engravings known and likely to rise further, as every year new rocks with hundreds of engravings each are discovered. However, at the beginning of the twentieth century, only the Cemmo boulders in Valcamonica were known, thanks to the discoveries of the geographer Walther [Laeng \(1914\)](#), who found and published the boulders that local people used to call ‘the rocks of the puppets’ (*le prede dei pitoti* in local dialect). In fact, most discoveries in Valcamonica were made during the 1930s thanks to the archaeologist [Raffaello Battaglia \(1934\)](#) and the anthropologist [Giovanni Marro \(1930\)](#). A more scientific appreciation of the different phases appeared during the 1960s and the 1970s with the works of [Emmanuel Anati \(1962, 1976, 1982\)](#) and other scholars, among them especially [Raffaele De Marinis \(1988, 1994b\)](#). With the discovery of rock art on the east side of Lake Garda in 1964 ([Pasotti 1965](#)) and in Valtellina, a border valley in the north of Valcamonica, in 1966 ([Pace 1968](#)), it became clear that this zone of the central-eastern Alps, from Valtellina to Lake Garda, can be considered a single petroglyph area with common stylistic, thematic, and chronological characteristics. The principal area remains Valcamonica, inscribed in the UNESCO World Heritage List since 1979, with its exceptional thematic and iconographic wealth ([Anati 1982](#); [De Marinis 1988](#); [Arcà et al. 1995](#)). However, no comprehensive corpus for Valcamonica and Valtellina has yet been published.

Engravings on rock surfaces

The art is mainly located in the open air and on flat rocks. From Pisogne on Lake Iseo, south of Valcamonica, to the sites of Sellero-Grevo in the centre of the valley, the rocks are composed of sandstone, whilst in the upper part of the valley and in the entire Valtellina they consist of schist, and at Lake Garda of limestone. These rocks, sandstone, schist, or limestone were polished and moulded by glaciers. In these areas we find mainly engravings; only very few paintings have been discovered to date ([Fossati 2001a](#); [Hansen 2008](#)). The engravers used hammering and scratching techniques, with hammering being the most common. Quartz tools were used to decorate the rocks: in fact, it is possible to find these artefacts, as they have been abandoned near the rocks ([Fossati 1993](#)).

Spirals and necklaces are probably the most ancient figures attributed to the Neolithic. Spirals are a rare motif in Valcamonica, but more widespread in Valtellina: five figures are engraved on the Rupe Magna of Grosio ([Fig. 45.1c, d](#); [Fossati 1995](#)). The same rock also shows some so-called cross figures ([Fig. 45.1e, g](#)) and some necklaces in the shape of an upside-down U ([Fig. 45.1e, f](#)), also known from the female final Neolithic statue-stelae of the region, such as the famous Caven 3. These three signs—upside-down U, spirals, and crosses—have definite connections with the megalithic art of western Europe, where they sometimes appear together in the slabs engraved in the passage graves of Ireland (see [Jones et al.](#), this volume), whilst in Brittany spirals are rarer. In Ireland, spirals can be associated with other spirals, but also with ‘spots’, U-shaped figures, or cup and ring marks ([Eogan 1986](#)); U-shaped figures are often associated with other megalithic symbols, such as combs and stars ([Shee Twohig 1981](#)). All these signs appear together on the stelae-menhirs of the Valcamonica–Valtellina group, such as Caven 3 and Ossimo 4 and 10 ([Fedele and Fossati 1994](#)). Spirals are sometimes found near cup and ring motives in Carschenna (Graubünden, Switzerland) ([Schwegler 1997](#)). On rock 4 at In Valle (Paspardo, Valcamonica), a spiral is overlain by a human figure in the so-called ‘praying’ position.

The interesting collocation of the five spirals on the Rupe Magna at Grosio (Valtellina), almost aligned in the central part of the rock, can perhaps be paralleled with the dislocation of these signs in Irish megalithic art. According to [Eogan \(1986\)](#), this choice of putting the spirals almost always outside the mounds, whilst other signs are inside, could reflect a characteristic and ritual function in the Irish megalithic art. At present we do not know of any settlements belonging to the second phase of the Square Mouth Vessel culture (VBQ, Vasi a Bocca Quadrata), the Neolithic period when pottery

bears a characteristic decoration in the so-called meander-spiral style. Probably, spirals and U-shaped motifs in Valcamonica and Valtellina are a production of this culture, whilst topographic figures could be a rock art manifestation of the third and last VBQ phase, a period for which two different settlements are known in Valcamonica, one at Breno Castle (BS; [Fedele 1988](#)) and another at Coren Pagà at Rogno, the latter with influences of the Lagozza culture ([Ferrari and Pessina 1997](#)).

The so-called topographic figures are found from around the second half of the fourth millennium BC onwards. These are probably the first representations or maps of land as territory, whose execution on cliffs is perhaps tied to a real division of agricultural lands sanctioned by the ritual practice of rock art production ([Arcà 2005](#); [Fossati 1994, 2002](#)). The existence of topographic representations in the Valcamonica rock art tradition was first reported by Raffaello Battaglia during the first International Congress of Prehistoric and Protohistoric Sciences held in 1932 in London, when he announced the discovery of the Bedolina Map. This composite design is the best known topographical representation in the Alpine archaeological literature. Battaglia describes the map as ‘careful representations of fields and fences’, dating it to the Iron Age ([Battaglia 1934](#)). This was in concordance with his general dating of the rock art phenomenon, and for the Bedolina Map has been confirmed by recent research ([Turconi 1997](#)). Much later, Battaglia and Acanfora (1954) published the boulder of Borno 1 with the oldest known topographical representations; their proposed date today is the fourth millennium BC. [Giovanni Leonardi \(1950\)](#) reported topographical figures from a rock at a site called ‘Saint Rocco bridge’, a rocky surface that emerges directly from the river Oglio. These publications are important, as scholars at the time were usually more interested in publishing figures of animals, warriors, or artefacts. Figures that may be considered ‘less figurative art’, like the topographical ones, were of less interest.

The first attempt to establish a more complex and acceptable chronology was made by Emmanuel Anati. He divided the Valcamonica rock art into several phases ([Anati 1966, 1982](#)) and positioned the topographical representations between the Neolithic and the Bronze Age, although some are now known to be more recent (see above). In recent years, these figures have again received interest due to new discoveries ([Sansoni and Gavaldo 2009](#); [Arcà 2003](#); [Arcà et al. 1995](#)). The main motifs can be summarized as follows ([Fig. 45.2a, b](#)):

- *spots* are represented by sub-rectangular pecked areas and appear on both flat rocks and boulders. This motif appears to be the oldest;
- *double rectangles* (and sometimes single rectangles) have mostly been drawn

- in contour, but sometimes have a dot in the centre or are completely pecked;
- *groups of dots, or lengthened dots* (also called ‘macaroni’);
- *oval shapes*, sometimes associated with other forms, such as spots and rectangles, and often connected with lines;
- ‘*mushrooms*’, a composition of different motifs: double rectangles, oval shapes, rectangles, dots;
- the ‘*bandolier*’ or shoulder-belt figure is a circular map with a single or double contour line. Two or more semi-circular lines, sometimes cut in the middle, occur inside or outside the circle. It is the strangest figure in the repertoire of the topographical representations.

All these types appear not only on rock surfaces but also on final Neolithic monuments (boulders, stelae, and menhirs) in Valcamonica, whilst in Valtellina only the ‘bandolier’ has been engraved and the other types are present only on rock surfaces.

In terms of chronology, the ‘spots’ (*maculae* in Italian) are often covered by figures belonging to later periods, for instance the so-called Remedello dagger. This is the case at the Borno 1 boulder (Fig. 45.2b), where three daggers overlap two spots. This type of dagger is very important for dating, since its chronology is very well understood. It appears in tombs of the eponymous Remedello culture and is frequently engraved on the menhirs and stelae of the final Neolithic (Arcà and Fossati 1995; Pedrotti 1993; De Marinis 1994a) and in some rock shelters, such as in the important composition of Les Oullas, Ubaye Valley (France) (Muller et al. 1991). The radiocarbon dates of the Remedello tombs with the daggers give an approximate age of 2900–2500 BC (De Marinis 1997), i.e. the Remedello 2 period, which marks the end of the Neolithic and the beginning of the final Neolithic in the north Italian archaeological chronology (Fossati 1994). The topographical representations covered by depictions of this weapon are hence older than this period. The spots are sometimes overlain by the double rectangle. On the boulder at Bagnolo 2, the double rectangle is overlaid by a solar disk attributed to the final Neolithic (third A1, Remedello 2 phase), which implies that this type of image also appeared before Remedello 2 (probably around the first half of the fourth millennium BC), perhaps during the Remedello 1 phase (3400–2900 BC; De Marinis 1997) (Fig. 45.2c). Sometimes this type of figure has the shape of a grid, as on rock 13 at Vite (Paspardo) (Arcà 1994).

The groups of dots, or lengthened dots and oval shapes, are often associated with the double rectangle, forming strange figures that we have called ‘mushrooms’ and which appear on large surfaces and on boulders. Whilst investigating rock 36 at Vite, Paspardo (Fig. 45.2d), where such a figure is present in connection with a couple of daggers with triangular blade and squared pommel (similar to the type called

Tecelinga, dating to the fourth and third millennia BC), a votive hoard containing a polished stone axe dated to the Neolithic, flint artefacts, and pottery sherds (White Ware type) was discovered at the base of the rock (Fossati 1997). If there is a connection between hoard and rock art—which seems to be the case—this is important for the chronology of the imagery, as well as the interpretation of the maps. Recently, this hypothesis has been confirmed by the discovery of a decorated boulder (called PAT 29) inserted into stone circle n.174 at the megalithic site of Pat near Ossimo (Valcamonica). The circle dates to the first half of the fourth millenium BC, whilst the boulder shows topographic figures of the double rectangle type and a Tecelinga-type dagger (Poggiani Keller 2009).

The ‘bandolier’ usually appears on final Neolithic monuments. Its association with motifs from different final Neolithic phases, such as the Remedellian dagger, or the Villafranca halberds dated to the Bell Beaker phase of the final Neolithic (2500–2200 BC), helps us to assign this type to the topographical figures belonging to the final Neolithic. These figures appear not only on boulders and stelae, but also on flat rocks, as on Vite rocks 20 and 21, often surrounding the usual double rectangles (Fossati 1994).

Boulders, Stelae, and Menhirs

The final Neolithic (fourth to third millennium BC, the so-called third A Camunnian style) is characterized by the appearance of stelae in the form of slabs, boulders, menhirs, and immovable blocks from landslides (the so-called ‘monumental compositions’) (Casini and Fossati 1994). As demonstrated by the work of Francesco Fedele (2006) at the site of Anvòia and more recently by the discoveries at Pat, both near Ossimo in Valcamonica (Poggiani Keller 2009), stelae and engraved boulders were erected to create alignments near flat cairns, with the engraved side of the stelae facing east (Fedele and Fossati 1994). These sites had certainly ritual and maybe religious functions for small communities or families, representing also a nodal point for boundaries and intertribal relations (Casini and Fossati 1994; Fedele 2006).

Anthropomorphism is suggested by the distribution of the engraved motifs on the rock (e.g. ornaments and weapons appear in positions where they would have been worn on a living person) and sometimes by the bevelling of the upper part of the stelae, schematically outlining the shoulders (Fig. 45.2e). The representation of a single person is rare and in the majority of cases these objects appear to be a composition of different figures which show elements differentiating them from the monuments of other Alpine stelae groups, such as the

Lunigiana, the Aosta-Sion, and the Trentino-Alto Adige monuments. Moreover, in the Valcamonica–Valtellina group the process of engraving may have been stretched over decades or even centuries, with the addition of new figures that complete or efface previous ones. We can distinguish three different periods of carving within the third A phase: a first phase called third A1, characterized by symbolic figures; a second phase called third A2; marked by anthropomorphic figures; and finally the very short third A3 phase, which very probably has to be attributed to the early Bronze Age (end of the third millennium BC) (De Marinis 1994a).

The iconographic repertoire of the most ancient phase (the third A1 style) is typified by the representation of the so-called Remedello dagger with its well-defined triangular blade and half-moon-shaped pommel (Fig. 45.2f). It is attested in contemporary tombs at Remedello (2900–2500 BC) and on final Neolithic Alpine stelae at Aosta, Sion, Arco, or Lunigiana. Other figures are associated with this dagger, such as weapons (axes and halberds of metal or stone), animals (deer, dogs, foxes, wolves, chamois, ibex, boars, bovines), and a few other symbolic figures (Fig. 45.2e) (Casini and Fossati 1994). Chariots and ploughing scenes may appear in these compositions. The weapons are always associated with the figure of the sun, an aspect that symbolizes the emergence of a hierarchy, whereby people probably represented themselves as descendants of the divinities. Even in the statue-stelae of the other Alpine groups, the association between sun and weapons refers to male personages always indicated by the daggers (Gallay 1996). In contrast, the double spiral pendant reproduces a copper ornament symbolically connected with the females (Fig. 45.2g) and ultimately originating from the Carpatian Basin, from where female ceramic figures, which have sometimes been interpreted as Mother Goddesses, also spread in the Neolithic (see Nanoglou, this volume). The copper spiral is hence an element of a ceremonial and status dress, perhaps even representing a goddess (Casini 1994). Other adornments (eye pendants, necklaces, combs) are associated with these feminine representations. The third important symbol is a rectangle filled with vertical lines or a chess-board like formation, adorned on the vertical sides with fringes (Fig. 45.2h). This motif is often associated with animals: compositions of deer with does (harem), usually placed below, and a series of wild dogs and chamois, disposed vertically along the sides (Camuri et al. 1993). This symbol is probably masculine, as during the anthropomorphic phase (style third A2) it is represented by an anthropomorph with a phallic symbol. The presence of the fringes suggests an interpretation as a cloak. This is also confirmed by the statue-stelae of the Trentino-Alto Adige region, where a similar motif is represented on the shoulders of the stelae. In

this element it is possible to recognize a particularly significant attribute of a god which can represent him as a *pars pro toto*. These three main symbols (dagger, spiral pendant, cloak) recur singly or together on the same stone, as if a stone could represent a sort of statue of one single divinity, or of two or three gods (Casini and Fossati 1994). The interpretation of a divine figure is here preferred to the idea of the menhirs as ancestor-heroes or even living people, as the human figures represented here are shown in conjunction with solar attributes (i.e. a man surrounded by a solar crown) and always show a massed appearance of weapons such as daggers, halberds or axes, whilst contemporary male graves of the Remedello culture contain only one such item. It is likely that this repetition was intended to stress the power of the solar god.

The iconographic repertoire of phase third A2 is not as wide as in the previous period. The symbols now become anthropomorphic, but some artefacts remain, such as the weapons. These are always important for the chronology of the monuments, in particular the daggers of Bell Beaker type (e.g. the so-called Ciempozuelos type) and halberds of Villafranca type. These are the typical weapons of the Bell Beaker period (2500–2200 BC) (De Marinis 1994a). Animals and human figures are now represented with more realism in a semi-naturalistic way. In general, we witness a cult focused on a divine triad of two males and one female (Fig. 45.2i) (Casini and Fossati 1994) in Valcamonica, and one male and two females as suggested for Valtellina (Casini et al. 2007). Period third A3 shows only anthropomorphic figures dancing in circles and daggers of the early Bronze Age (Fig. 45.2j) (De Marinis 1994a).

CONCLUSIONS

The carvings and stelae in Valcamonica–Valtellina bespeak the preoccupation of, amongst others, the agricultural and pastoral populations in the southern Alps during the Neolithic and Chalcolithic. They can be analysed in terms of daily preoccupations (maps of topographical features), status competition and identity (items of personal ornamentation, weapons), and mythology and local religious traditions (Casini and Fossati 1994), although many of the motifs remain abstract. Much work still needs to be done in relating the insights gained from this corpus to other archaeological evidence, such as the trends evident in settlements and burial sites, or the economy and long-distance relations with other cultures, in order to further understand the role of these long-lived ritual landscapes in the social and ideological development of Alpine populations.

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CHAPTER 46

ROCK ART AND THE ROCK SURFACE NEOLITHIC ROCK ART TRADITIONS OF BRITAIN, IRELAND, AND NORTHERNMOST EUROPE

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INTRODUCTION

THE Neolithic engraved and incised rock art of Britain and Ireland is a feature of both open-air rock surfaces and upstanding monuments like passage tombs and stone circles. In this respect it is similar to the rock art of parts of Iberia ([Fairén-Jiménez](#), this volume) and northern France. A key feature that marks out this art as different to other areas of northern Europe is the emphasis on the carving of abstract images. For instance, rock art in northern Fennoscandia and Russia, like elsewhere on the Eurasian Taiga (cf. [Martynov 1991](#)) is dominated by representational images depicting elks, but red deer and reindeer are depicted too. Great variations are, however, found and several regional traditions can be identified ([Lindqvist 1994](#); [Simonsen 1974](#)). Boat images are frequent in some of these traditions and at the Atlantic coast of Norway the boats are followed by images rendering whales, fish, and waterfowl ([Sognnes 2001](#)), which together form a maritime complex partly contrasting the elk-dominated Taiga complex. Yet, maritime motifs are surprisingly few considering the many coastal and lakeside rock art sites. These traditions originated in the Mesolithic but lasted through the Neolithic (c. 4000–1800 BC), which in most of Norway (for instance) is largely characterized by hunting, fishing, and gathering until at least the third millennium ([Prescott 1996](#)), complicating the use of period terminology. As evidenced by the distribution of artefacts of, respectively, southern and northern origins, some contact, however, existed between these groups and Neolithic farming communities elsewhere in northern Europe. In Finland rock paintings only are known; virtually all are

found at the large lakes in the south-east (Kivikäs 1995; Lahelma 2008). In north-western Russia rock carvings dominate, with foci at Lake Onega and the White Sea (Savvatejev 1977, 1982), whilst paintings and carvings are found at the Kola Peninsula (Shumkin 1990). This is also the case in the northern regions of Norway and Sweden (Bøe 1932, Engelstad 1934; Gjessing 1932, 1936; Hagen 1970, 1976; Hallström 1938, 1960; Helskog 1988; Simonsen 1958).

Studies of open-air rock art in Britain have tended to focus on landscape location to provide a context for interpretation (e.g. Bradley 1997). Studies of passage tomb imagery have focused on structural symbolic analyses (e.g. Thomas 1990; Tilley 1991; Bradley 1998) or 'hermeneutic' interpretations (e.g. Thomas 1992, 1993), or compared motifs with images generated during altered states of consciousness (e.g. Lewis-Williams and Dowson 1993; Dronfield 1995, 1996). In recent years, however, new approaches have been developed which blend image position within rock art panels, passage tombs, and the environment (e.g. Shee Twohig 1996; Thomas 2001). In pursuing these recent approaches, we focus here upon the relationship between motifs and rock surfaces through time. We argue that a consideration of the dynamic between image and surface offers a route into considering why rock art traditions differ so starkly in Britain and Ireland from the rest of continental Europe.

Studies of Scandinavian 'Neolithic' rock art to a large extent have focused on chronology; when this art was made, and how it relates to the rock art of the Bronze Age. During recent years much effort has concentrated on dating by means of Holocene land uplift in coastal Norway and Sweden (e.g. Hesjedal 1994; Lindqvist 1994; Ramstad 2000) and in the lake districts of Finland (Kivikäs et al. 1999). Interpretations of the symbolism and cultural context of the art have widened from a total dominance of hunting magic interpretations to landscape studies (Gjerde 2002; Sognnes 2001), detailed readings of individual panels (Sognnes 2008a), structuralist studies (Hesjedal 1994), and analyses that suggest the art was associated with shamanism (Gjessing 1936; Grønnesby 1998) and totemism (Hesjedal 1994). Whilst the rock art of northernmost Europe, with its emphasis on a non-domesticated world, may look strange and alien from a European Neolithic perspective, we will argue that contacts between the hunter-gatherer-fishers of the north and farmers in central and western Europe were important in the development of the imagery during this period.

THE OPEN-AIR ROCK ART OF BRITAIN AND IRELAND

As noted, one of the major characteristics of open-air rock art in Britain and Ireland is the emphasis on abstract images, including simple cup marks, cups with one or more rings, cup marks with tails/radial lines (or cup and rings with tails/radial lines), spirals, and rosettes (see [Fig. 46.1](#)). Mostly, these particular images are relatively simple, although they can be combined into patterns of striking complexity. These traditions bear similarities with other regions of Europe, in particular Galicia in Atlantic Iberia ([Bradley 1997](#); cf. [Fairén-Jiménez](#), this volume), whilst cup marks are a component of the Bronze Age rock art traditions of southern Scandinavia dating after 1800 BC. Whilst these two regions—Galicia and southern Scandinavia—incorporate abstract images within a wider representational repertoire, representational images are extremely rare in Britain and Ireland.



FIG. 46.1. Carved rock surface, Ormaig, Kilmartin, Scotland, photographed at night.

(Photograph: Aaron Watson and Andrew Cochrane).



FIG. 46.2. Main areas of distribution of rock art in the British Isles (Bradley 1997).

(Reproduced by kind permission of Richard Bradley).

Representational images are confined to a few instances: the carving of early Bronze Age dagger and flat axe motifs on the inner ring of the upright standing stones at Stonehenge, Wiltshire (Bradley 2000; Cleal et al. 1995) and the carving of flat axe motifs on burial cairns at Ri Cruin and Nether Largie Mid and North, Kilmartin, Argyll, west Scotland (Simpson and Thawley 1972; Jones 2001). In addition, representational motifs are found on the outer kerb of early Bronze Age burial monuments at a few sites in southern England, including two dagger motifs, two flat axes, and five cup marks at Badbury barrow, Dorset (Piggott 1939), and a series of images of unshod human footprints and cup marks on a cist slab incorporated into a barrow at Pool Farm, Somerset (Beckensall 1999, 70). The nature and context of these representational images suggests that representation is a later element of rock art traditions in Britain and Ireland, associated in particular with the early Bronze Age (c. 2300–1500 BC),

and will not be considered further here.

The major concentrations of open-air rock art are in northern Ireland and in Britain from Derbyshire to Perthshire, with major concentrations in Northumberland, Argyll, western Scotland, Galloway, southern Scotland, and the North York Moors (Fig. 46.2). In Ireland the major concentrations are in south-west Ireland in Co. Kerry, with further smaller groups of rock art in Co. Donegal and Co. Louth and Monaghan (Bradley 1997, 70; Beckensall 1999; Purcell 1994, 2002). Bradley's (1997) analysis of the landscape location of rock art panels in Britain and Ireland suggests an important relationship between rock art and routeways and viewpoints; in some regions rock art appears to be marking significant routes through the landscape, or defining the edges of monument complexes.

PASSAGE TOMBS IN IRELAND

Passage tombs are arguably the most famous monument type in Ireland, with the Boyne Valley complex, Co. Meath, often attracting the most attention. Passage tombs in Ireland originated in the early fourth millennium BC and continued to be constructed until the early third millennium (Grogan 1991; O'Sullivan 2005; see Cummings et al., this volume). Passage tombs consist of a large sub-circular or ovoid cairn revetted by a continuous kerb of large stones; this kerb is a distinctive feature of Irish examples. Cairn sizes vary but are normally between 10 and 80m in diameter. The cairn covers a megalithic structure consisting of a chamber, with an aperture leading to the exterior via a passage (see Coffey 1912, 102; Collins and Waterman 1952, 28; Collins 1960; cf. Herity 1974, 22; Shee Twohig 1981, 204; Dronfield 1994, 75). Imagery on passage tombs is non-representational and consists of geometric abstract motifs, occurring on the kerbstones and the interior structural stones of the tombs in the Boyne Valley, rendering it the richest area of megalithic motifs in western Europe (Shee Twohig 1981; Eogan 1986; O'Sullivan 1993). An interesting feature of passage tombs in Ireland is the general priority of 'dexter over sinister' (Herity 1974, 123) reflected in the size of the right-hand recesses, the motifs, artefacts, and human remains.

Such a wealth of imagery suggests that, contrary to Herity's arguments (1974, 107), the motifs were not a 'by-product' or surplus extra. Rather, their importance was integral to the worldviews that helped create the monuments and subsequent encounters with them (Cochrane 2006, 254). Jones (2001, 335; see also O'Sullivan 1986) has argued that many academic studies dislocate panels and motifs from their original contexts and present them in isolation, in two-

dimensional form, predominantly in black-and-white line drawing on paper—a practice that privileges the static form of the motifs over more fluid social processes (cf. [Jones 2004](#)). Such conventions create a situation where the spectator, in studying motifs in a corpus (e.g. [O’Kelly 1973](#); [Shee Twohig 1981](#)), is under the illusion that the image is a ‘realistic’ representation of the original design ([Jones 2001](#)), and is also given an ‘observer-imposed’ selection of ‘acceptable’ visual images ([O’Sullivan 1986](#), 71). The presentation of motifs in this format also can facilitate the selective representation of carved panels to reinforce a point ([Shee Twohig 2000](#), 91). When modern spectators engage with passage tomb motifs today, many see them as complete compositions. These images did not always appear as one exhaustive display; there were episodes and sequences, be it by substitution or replacement of existing motifs by imposed motifs ([Eogan 1997](#); [Jones 2004](#); [Cochrane 2006](#), 2009a). [O’Sullivan \(1986, 1996\)](#) detailed the sequences from the standard geometric style, through to the extreme pick-dressing style as a final and mature phase ([O’Kelly 1971](#); [Shee Twohig 2000](#)). They can broadly be summarized as:

- Step 1 incorporates the standard style, including spirals, circles, zigzags, serpenti-forms, lozenges, triangles, and radial motifs, with the plastic qualities of the stone mostly ignored and designs created via picking and occasionally incision.
- Step 2 applications still include the standard style, yet are more ‘ambitious’ with bold carving and acknowledging the variants of the stone surface.
- Step 3 images are mostly linear designs following the shape of the stone, with appreciation to its three-dimensional form.
- Step 4 images abandon linear designs and adopt a ‘pick dressing’ approach, which sometimes mutilates many earlier works. Pick dressing is amorphous and displays a marked interest in greater exploration of the stone’s surface; it is generally located on the stone’s face nearest to the passage tomb entrance ([O’Sullivan 1996](#), 87; see also [Shee Twohig 2000](#)).

On the kerbstones at Knowth Site 1, one can document two and sometimes three episodes of superimposition ([Jones 2004](#), 204), but superimposition is even more apparent in the interiors of the passage tombs. In the interior of Knowth Site 1, incised angular motifs (triangles, lozenges, and zigzags) are the earliest images ([Eogan 1997](#), 222). They occur on 30 stones in the chamber and passage of the eastern tomb, and on 11 stones in the western tomb. Some of these incised motifs were later superimposed with an infill of picking. This later picking occurs as angular in shape and confined in space; formless loose area picking, broad picked lines in ribbons, and formless close area picking ([Eogan 1997](#), 221). As not all the early incised angular motifs were filled by later picking, it is believed that some incised lines were not just guide lines but motifs in their own right ([Eogan 1997](#), 223). Others definitely did act as guide lines, as is seen on Corbel 37/38 of the western tomb, Knowth Site 1, where

picked angular motifs and dispersed area picking overlay the angular incised motifs (Eogan 1997, 223 and fig. 8). Including the incised motifs, there are five episodes of superimposition on the interiors of the two passage tombs in Knowth Site 1; there are four principal forms of overlay at Newgrange Site 1.

These successive episodes demonstrate the plurality of performances involved in the fabrication of images (Cochrane 2006, 266). Superimposed imagery may therefore have connected past and present, whereby the practice of carving motifs may be associated with renegotiation or regeneration. As these acts involved contact with the traces of past actions, revising the surfaces left by those acts, they can be seen as contentious, contradictory, messy, problematic, and stimulating—including for the archaeological writer (Cochrane 2009a, 167). Once created, motifs on passage tombs are susceptible to defacement and alteration, be it intentional or otherwise—rock art allows manipulation rather than providing fixity. Ambiguous abstract motifs carved in stone therefore provided opportunities for repetition, revision, and reinterpretation.

The possible significances of circle motifs and the circular nature of the passage tomb mounds themselves have been discussed at length by Bradley (1998, 104–9). We further suggest that the circle dwellings, circular palisades, circular stone settings, circle mounds, and circular motifs address different expressions of temporality which adhere in each structure (see also Ewart 2003). The circle form may have evoked (at some level) a cyclical perception of time, which stems from a certain type of practicality (Gell 1992, 91). Such a view of time may have been linked to a subsistence strategy that held a close relationship with the seasons. The transformation of this worldview into an important structure, such as a passage tomb and the subsequent superimposition of motifs, may have resulted from a desire to have a sense of temporal control over certain atemporal situations; circles in stone were permanent yet alterable, and thus could be in flux. Certainly, the idea of a linear historical perception of time has been tracked to meta-narratives of western Enlightenment, and it is noted that European Medieval worldviews mostly saw the universe as changeless and cyclical (Thomas 2004, 31; Cochrane 2009b). For some people in the Neolithic, time may have flowed in a similar direction.

One of the authors (Jones 2004, 207) has proposed that stone is used to embody a significance of place. The application of motifs to stone is seen as an ongoing reiteration or replenishment of this significance of place and identity. We might further argue that it is the process of creating an image that is more important than the type of motif itself. The images on the exteriors of the passage tombs in the

Boyne Valley were mostly created *in situ* and as one event, whereas the interior motifs seem to have involved various stages and episodes of superimposition. Jones has suggested that the internal images acted as ‘technologies of remembrance’ (2004, 209), and were executed to memorialize the significance of place and identity; remembrance is activated through visual engagement and repetitive image making. The differences in styles are thought to be the result of different people employing distinct mnemonic practices, which may align themselves with different ways of seeing the world. From this perspective one can argue that the motifs are part of a ‘work in motion’ and of bringing a particular worldview repeatedly into existence (see [Whittle 2003](#), 25; [Jones 2007](#), 86–90).

OPEN-AIR ROCK ART OF HUNTER-GATHERER-FISHERS IN NORTHERNMOST EUROPE

The making of rock art by northern hunter-gatherer-fishers started some time during the Mesolithic but, based on the Holocene land uplift, we know that many sites cannot be older than the Neolithic, as the images in question cannot have been made until those rock surfaces emerged from the sea ([Sognnes 2003](#)). In fact, the Mesolithic/Neolithic period division in the region is based on artefact assemblages and seems to have little bearing on the making of rock art. The later part of the Scandinavian Mesolithic, c. 6300–4000 BC, is contemporary with the central and western European Neolithic, which means that some Scandinavian Mesolithic hunter-gatherer-fishers might have had contacts with Neolithic farmers which may have led to changes within Scandinavia. Habitation became more sedentary and people started making rock art, both representing a new sense of permanency. Rock art and larger dwelling sites likely represent places that were visited more frequently than before. The emphasis on traditional symbols in rock art (elk, deer, reindeer, whales/porpoises, and waterfowl) suggests a response to and a symbolic rejection of new times and new customs. The symbolic system was focused on the forests and seas, particularly the larger and stronger prey animals. This animal symbolism is also evident on artefacts: slate points and knives were decorated with geometric line patterns and animal drawings. The shaft ends of knives sometimes were shaped like animal heads and many knives were shaped like a whale or fish ([Sognnes 2008b](#)).

At Evenhus, central Norway, rock carvings are found at panels that did not emerge from the sea until the early second millennium transition from the Neolithic to Bronze Age ([Sognnes 2003](#)). At that

time these panels were at the eastern tip of an island located virtually in the middle of the Trondheim Fjord. The Evenhus rock carvings show a mixture of terrestrial and maritime motifs; elks and reindeer representing land, whales and boats representing the sea (Fig. 46.3). We may here witness expressions of competition and claims for control of the site and surrounding sea and land by different groups, possibly presenting community identities, or perhaps represented by their respective totems.



FIG. 46.3. Transcription of carvings on a rock surface at Evenhus, Trøndelag, Norway (Gjessing 1936).

Less than 4km away, across a narrow part of the fjord, the largest cluster of what seem to be pre-Bronze Age boat images made by farmers are found at Røkke. These carvings are not facing the sea, but are located on hillocks around 100m above sea level. They are withdrawn from the sea, which apparently still was the domain of the hunter-gatherer-fishers who still marked seashore rocks with their traditional symbols. This may represent competition between groups with different subsistence economies. Whether there actually were any confrontations between groups is uncertain, but at the large Bardal site near Evenhus, ‘southern tradition’ rock carvings (boat images, footprints, anthropomorphs, concentric rings, etc.) were superimposed on some older strata mostly containing elk images (Sognnes 2008a). This seems to present a deliberate defacing of an old and alien Neolithic hunter-gatherer-fisher rock art.

Across the border in northern Sweden, permanent farming was established much later than in southern Scandinavia and coastal Norway—largely from the early Iron Age onwards, with some attempts at small-scale farming in the Bronze Age (Baudou 1989). In the northern Swedish forests many small sites with rock paintings of mainly elks have been discovered during the past decades (Lindgren 2004). Similar rock carvings have been known since the eighteenth century AD, located along major watercourses in the regions of

Jämtland and Ångermanland. Of special interest is a large site at Nämforsen waterfall in the Ångerman River ([Hallström 1960](#)). Most of the carvings here are found on small islands in the middle of the large roaring waterfall and dated to the Neolithic ([Forsberg 1993](#)). Two major classes of elk images, each showing the animal in profile, exist. In the early Neolithic, the entire trunk area of the animal is pecked out, whilst in the late Neolithic a pecked line traces the elk's outline. Nämforsen also has many maritime motifs, mostly boat images. Like the elks, the hull of the boat images may be fully pecked out or only delineated by a pecked exterior line. Similar carvings are found at certain heights above sea level, showing that there is a spatial clustering of types and styles ([Forsberg 1993](#), 227–228). The distributions of these different types do not decisively demonstrate that they were made at different times; they may represent at least two different social groups, each using particular panels at different heights for their own carvings.

At the inner Alta Fjord in northernmost Norway an even larger concentration of rock carvings is found, which may represent several phases, from late Mesolithic through Bronze Age. Two of these phases fall within the Neolithic. Boats and other maritime motifs were frequent in the early Neolithic but were hardly made later. Most zoomorphic images were drawn with outlined bodies alone, but many near the boat images have trunks filled with line patterns. Pecked-out animals were frequent in the late Mesolithic ([Helskog 1988](#), 32). There are several elaborate scenes containing humans, elks, bears and bear dens, fences, boats, and fish ([Helskog 1988](#), 1999). Scenic representations are also frequent in the rock art of the White Sea in Karelia, north-western Russia, several of which depict hunting of whales from boats or winter-time hunting of elks by skiers ([Savvateyev 1977](#)). Most of the zoomorphic images found here and at Lake Onega ([Savvateyev 1982](#)) are pecked out and are comparable to the carvings at Nämforsen and in Alta. Dwelling sites are found near the Karelian rock art panels, as in Alta and at Nämforsen, and excavations demonstrate that people lived at the shore of Lake Onega and the River Vyg, close to the rock art panels, during the Neolithic and Eneolithic ([Savvateyev 1988](#)).

DATING THE NEOLITHIC ROCK ART OF BRITAIN AND IRELAND

A major question is how the open-air and monumental rock art traditions in Britain and Ireland relate to one another. The passage tomb art of Ireland is dated to the middle Neolithic to late Neolithic

(c. 3600–3100 BC; [Cooney 2000](#)), although the final use of passage tombs may date to later than this; the related passage tombs of Anglesey date from the early Neolithic (c. 4000–3000 BC; [Burrow 2006](#)). Orcadian passage graves emerge at a slightly later date, around 3300 BC, as does the art of the late Neolithic settlements of Orkney (though see [Schulting and Sheridan 2010](#) for slightly earlier dates for some passage graves in Orkney). The stone circles associated with passage tomb art, such as the Cumbrian group, are also likely to date from the late Neolithic ([Beckensall 2001](#)).

The dating of decoration on open-air contexts, such as stone circles, offers significant challenges: is the carving contemporary with the use of stone circles, or a later addition? The best chance of dating open-air images comes from motifs in dateable contexts. Rock art traditions continue into the early Bronze Age with the carving of abstract and representational images often on slabs associated with burial monuments in Britain ([Bradley 1995](#); [Bradley 1997](#); [Jones 2001](#)). These provide a *terminus ante quem*, but do not answer when rock art began to be produced. Some cup marks can be dated to early Neolithic contexts, including the cup-marked slab from the longbarrow at Dalladies, Kincardineshire ([Piggott 1972](#)). Cup marks are also associated with early Neolithic portal dolmens from Ballyrennan, Co. Tyrone, Ireland; Bachwen, Canearvonshire; and Trelyffiant, Dyffryn Ardudwy, Merionyddshire, Wales ([Darvill and Wainwright 2003](#)). Whilst the association between cup marks and portal dolmens seems compelling, we have to treat these associations with caution, as they may be fortuitous.

Evidence for rock art dates in late Neolithic contexts is more convincing. The decorated cist of a burial site from Knappers, Glasgow, Scotland, was freshly carved for the burial, which was associated with a late Neolithic Seamer axe, a form of polished stone axe ([Ritchie and Adamson 1981](#)). Pits containing late Neolithic Grooved Ware pottery were found associated with rock art panels at Backstone Beck, Ilkley Moor, West Yorkshire ([Edwards and Bradley 1999](#)).

In addition a series of recent excavations have been undertaken around open-air rock art sites in Britain and Ireland. Whilst some evidence for Neolithic activity was found at Drumirril, Co. Monaghan, Ireland, activities associated with the rock art site extended into the early Christian period ([O'Connor 2007](#)). At Ben Lawers and Torbhlaren in Scotland, finds of Arran pitchstone, a lithic source used during the Neolithic, are suggestive of a Neolithic date; whilst at Torbhlaren, activities around the rock art sites date from the Neolithic to the Medieval period. Activity commenced with the construction of a post circle 1.5m in diameter next to the rock art site. This was burnt

down around 2500–2300 BC, during the late Neolithic. Immediately after, a stone platform was constructed around the site, associated with quartz artefacts (11 definite and 25 probable hammerstones). As the platform respected the site of the post circle it seems likely that its construction also dates to the period 2500–2300 cal. BC. In addition, a cluster of hammerstones and knapping debris associated with one of the Torbhlaren rock art sites was dated to c. 2900–2800 cal. BC (Jones et al. 2011). Whilst these activities do not absolutely date the associated rock art, they provide a proxy date for its execution, as the major class of stone tools recovered from these features are quartz hammerstones, likely to be employed in rock art production.

Much has been written on the connections between passage tomb motifs and those found on natural rock surfaces. Previously it was suggested that passage tomb images pre-dated rock art, with there being continuity into the early Bronze Age (Shee Twohig 1981; Johnston 1993; Jackson 1995; Bradley 1997; Cooney 2000). Recently, however, Waddington (1998) has argued that cup and ring marks (normally associated with open-air rock art) on orthostats from Newgrange Site 1 were incised before inclusion, suggesting that the rock art tradition is older than the act of carving passage tomb images (see also Van Hoek 1988; Edwards and Bradley 1999; Coyne 2001; Purcell 2002; O'Connor 2003). Waddington (1998) does, however, concede that cup and ring marks do occur in later periods, with examples from the stone circle at Newgrange and the early Bronze Age.

In summary, it seems likely that the rock art traditions in Britain and Ireland commenced in the early Neolithic and continued until the early Bronze Age, with a peak of activity during the late Neolithic. This is confirmed by the dating of passage tombs in Ireland and the fact that open-air rock art motifs are components of a wider repertoire of motifs associated with late Neolithic artefacts, such as Grooved Ware pottery (Bradley 1997; Jones 2000); decorated maceheads, such as that from Garboldisham, Norfolk (Edwardson 1965) or Knowth Site 1, Co. Meath (Eogan 1986); and objects such as the carved chalk artefacts known as the Folkton Drums (Longworth 1999).

DATING THE NEOLITHIC ROCK ART OF NORTHERNMOST EUROPE

It is clear that in northernmost Europe the Neolithic rock art cannot be understood in isolation from Mesolithic artistic practices; continuity is evident here that is not present in Britain or Ireland. Indeed, only some of the rock art in northernmost Europe seems to

have any relation with societies normally covered by the term Neolithic. Vast areas in this region have never been cultivated: hunting-gathering-fishing has prevailed for millennia, even after most of Europe entered the Bronze and Iron Ages.

In Karelia, rock art and dwelling occur together on ancient shores. A number of dwelling sites have been excavated at Lake Onega and at the river Vyg by the White Sea ([Savvateyev 1988](#)). At the Vyg, dwelling sites were dated to the Neolithic by artefacts, with radiocarbon dates around 5000 BP. Some rock carvings were covered by deposits dated to 1500–1300 BC. At Lake Onega, Mesolithic sites were believed to be much older than the rock carvings; however, Eneolithic dwellings were excavated too. In western Norway excavations at Vingen and Ausevik ([Lødøen 2007](#)) yielded fireplaces and dwelling structures. Most artefacts belong to the late Mesolithic, as do a series of radiocarbon dates. At Ausevik ([Fig. 46.4](#)), there were few artefacts, but the bottom sample from a series of radiocarbon dates from a charcoal sequence dated to the early Neolithic, the other samples were Bronze Age and early Iron Age. The bottom sample from a rock shelter with rock paintings at Vasstrand, Sør-Trøndelag, was dated to the transition between late Neolithic and Bronze Age. Similar dates were obtained from two decorated caves ([Sognnes 2009](#)). Most rock paintings in Finland are located on vertical cliffs emerging from the lakes. Areas immediately below some of these sites have been excavated. At Astuvansalmi, Ristiina, two arrowheads were found, one from the late Neolithic ([Sarvas 1969](#)). Underwater investigations in front of some of these paintings yielded a piece of amber shaped like a human face ([Taskinen 2000](#)).

A complicating factor for dating is that northernmost European Neolithic art has similarities with southern Scandinavian early Bronze Age rock art—similarities that can lead to confusion about whether motifs are Neolithic or Bronze Age in date. A fairly acceptable chronology for boat images of the south Scandinavian tradition has been established, based mainly on similar images engraved on bronze razors ([Kaul 1998](#)). Few razors are dated to the late Bronze Age, and none to the periods before and after the Bronze Age. The bronze razors have thus been used to suggest a chronological straightjacket for the rock art tradition that may not correspond with reality: boat types (contemporary, older, and later) not represented on razors are not included in the sequence. Whether boat images were made on rocks in the Neolithic is difficult to prove, but at least one type may belong to this period ([Fett and Fett 1941](#), 137; [Marstrand 1978](#), 65; [Sognnes 2001](#), 54).



FIG. 46.4. Carved rock surface, Ausevik, Sunnfjord, Norway (Hagen 1970).

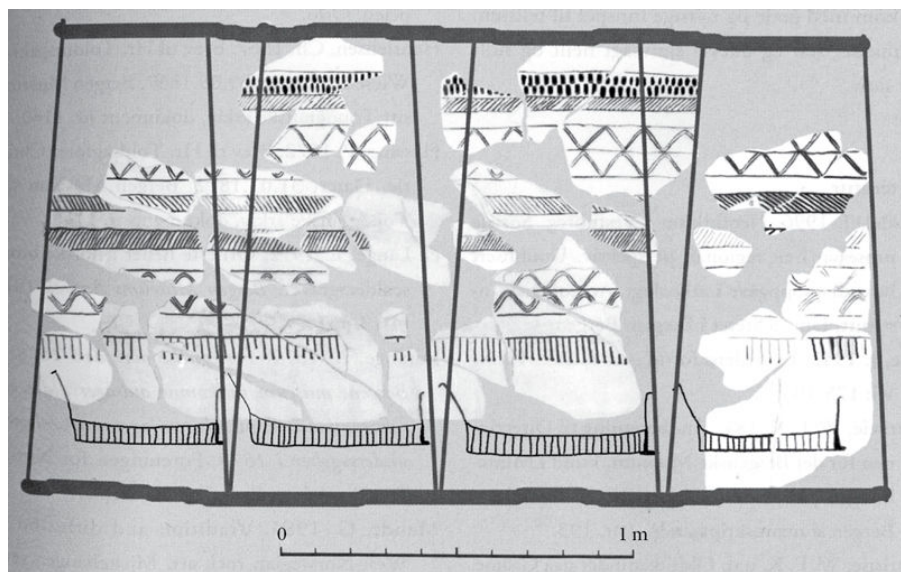


FIG. 46.5. Decorated cist slab, Mjeltehaugen, Sunnmøre, Norway (Linge 2007).

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In central Norway, where most of these images are found, they were made on the same panels as south Scandinavian Bronze Age images and seem to represent the earliest phase on these rocks, sometimes associated with cups and rings. In the same region, boat images from

the Scandinavian Bronze Age period 1 (1800–1500 BC) are found too; an earlier phase, then, may date to the late Neolithic (2200–1800 BC). These earlier boat images were also made in a different technique, with narrower and shallower lines. At Leirfall in Stjørdal, central Norway, a framed zigzag pattern adjacent to some of these boat images was made in the same technique and another panel has similar designs. These geometrical designs are reminiscent of a Bell Beaker decoration scheme, with bands of horizontal chevrons and zigzags, and strengthen the suspicion that we may be dealing with late Neolithic rock art. Beakers are virtually non-existent in Norway but were found at a dwelling at Oгна, south-western Norway ([Skjølsvold 1972](#)), whilst at Hitra, central Norway, an archer's wristguard of possible Beaker origin has been found ([Marstrander 1954](#)).

Similar designs are depicted on decorated slabs from stone cists in central and south-western Norway, which probably date to the early Bronze Age ([de Lange 1912](#), [Marstrander 1978](#), [Syvertsen 2002](#)). Unfortunately, all of the graves in question were disturbed when these slabs were found. The nearest European parallels to these designs, particularly chevrons and herring bones, but also circles and tassell-like parallel lines, are found in the Göhlitzch grave near Halle, Germany, which belongs to a group of tombs with decorated slabs from central Germany ([Marstrander 1978](#), 51–52). Horizontal bands with zigzags are also found at the Kivik grave in Scania, Sweden ([Kristiansen and Larsson 2005](#); [Randsborg 1993](#)), but otherwise no parallels exist between the Norwegian and the Kivik slabs.

The largest decorated grave cist in Norway was found in the Mjeltehaugen barrow in the Sunnmøre region, western Norway, in the early nineteenth century AD. Unfortunately all slabs were broken into numerous pieces shortly after discovery ([Linge 2007](#); [Mandt 1983](#)). The existing fragments most likely belong to several different slabs, some decorated on both sites. On most, the decoration follows the same scheme, with alternating horizontal bands of chevrons/zigzags and parallel lines and, at the bottom, a row of boat images similar to the open-air ones claimed to be Neolithic ([Fig. 46.5](#)). If we try to loosen the grip held by the conventional chronology, we may find that a late Neolithic date for the Mjeltehaugen slabs is feasible.

The provenance of these slabs is an interesting question. The rock is greenish-grey, fine-grained schistose meta-greywacke with rusty weathered layers rich in carbonate. Its nearest sources are in the Sunnfjord region, western Norway, and in the Trondheim Fjord area, central Norway ([Askvik 1983](#)). In both cases the slabs would have been transported over long distances, including rough stretches of open sea or portaging across one or more isthmuses between neighbouring fjords. Distribution studies for many Neolithic artefact

types, whether of south Scandinavian origin or made from local slates and schists, indicate that Sunnmøre belonged to a socio-economic sphere different from neighbouring regions to the south ([Bergsvik 2006](#)). Most likely, the Mjeltehaugen slabs came from the Trondheim Fjord area, where there are decorated slab fragments from several graves ([Mandt 1983](#), [Marstrander and Sognnes 1999](#)) and a major cluster of similar boat images from open-air sites, particularly at Røkke ([Sognnes 2001](#)).

The age of the Ausevik site in western Norway has been much debated. At this site several hundred zoomorphic carvings are found together with concentric rings and spirals frequent in the Bronze Age tradition ([Fig. 46.4](#)). Zoomorphs and rings appear to represent an entity, dated to either the Bronze Age ([Hagen 1970](#)) or to the Neolithic, showing influence from the cup and ring tradition in the British Isles ([Fett and Fett 1979](#), [Walderhaug 1998](#)). Gøran Burenhult (1980) argued in favour of a Neolithic beginning for the ring images in Scandinavia. The cup and ring tradition can be identified as far north as the inner end of the Trondheim Fjord around 64°N.

Other finds from south-western and central Norway indicate Neolithic and early Bronze Age contacts with western Europe, among them a spatula-shaped bronze axe from Vevang, Nordmøre. This axe was produced in the area between the rivers Rhine, Rhone, and Seine ([Rønne 2009](#)). At Lindås, in the same region, a carved stone ball from Scotland, probably Neolithic, was found ([Marstrander 1979](#)). Most likely, central and west European impulses reached south-western and central Norway during the Neolithic. These impulses were not mediated via south Scandinavia. They merged with existing local rock art traditions, in which boat images played an important role. At the beginning of the Bronze Age, local rock art traditions were replaced by a new symbolic system transmitted from south Scandinavia (cf. [Kristiansen and Larsson 2005](#)). Whilst boat images endured through this new tradition, the style of boat depictions changed, as did much else about the art, including a shift from animals to humans as the most common beings shown and a new emphasis on depicting human-made material culture alongside significant numbers of cup marks, rings, and geometric images.

DISCUSSION: SURFACE TENSIONS

Rock art in Scandinavia was made from the late (or perhaps even the early) Mesolithic to the Roman Iron Age, presenting two different symbolic systems and traditions, one made by hunter-gatherers-fishers and one by early farmers. Some, and possibly most, hunter-gatherer-

fisher rock art was made during the Neolithic, contemporary with the expansion of farming. Both traditions seem related to social changes, the rock art being used to create and mediate cohesion alongside cultural distinction.

Gjessing (1936) suggested that the later Neolithic rock art in Norway was made by shamans as part of rituals performed before and during the hunt. Recently, shamanism has been brought back into the discourse. In Norway, Geir Grønnesby (1998) has identified a series of geometric images which may be correlated with the three-stage model for shamanic entoptic images (Lewis-Williams and Pearce 2005). Shamanism has also been strongly argued for Swedish rock art (Fandén 2002) and for the Finnish rock paintings (Lahelma 2008). This has, however, been strongly criticized by Helena Günther (2009), who finds that Swedish scholars in particular seldom demonstrate how and in what way shamanism may be present in the archaeological material.

The total dominance of elk images has made it difficult to argue in favour of Scandinavian rock art representing totemism; alternative totems are hardly ever found. There are, however, some exceptions in regions where more than one representational motif is present, for instance in Alta, Finnmark (Olsen 1994). Anders Hesjedal argued in favour of totemism in his study of rock art in the provinces of Nordland and Troms, Norway, where images represent reindeer, bear, birds, seals, and whales. The majority of marine animals are, however, found in central Norway, where panels may contain fish, birds, or whales only. Sites at Hammer and Evenhus, Nord-Trøndelag, contain most of these motifs. Here clans with different totem animals may have met; at Hammer during the late Mesolithic and early Neolithic, at Evenhus at the end of the Neolithic. For south-eastern Norway, where rock art is dominated by elk images, Ingrid Fuglestad (2008) argues that we might identify different totemic groups by means of how the images were drawn. She suggests the existence of an early Mesolithic phase with animistic rock art represented by animals drawn by contour lines only and a later totemic phase during the late Mesolithic and early Neolithic, when the images had certain types of infill, which she suggests represent three possible totemic groups.

Different animals or infill motifs may symbolize clans with different totems, then, whilst the emphasis on the larger undomesticated animals symbolizes traditional values and ways of life in a changing world. But this art cannot be considered in isolation from the representational material culture of the period: both demonstrate ambiguous images which could be read in several different ways. Some knives were shaped like whales, but have tails shaped like a bear or a bird head. A bird image turned upside down resembles a

whale. An elk may have the antler of a reindeer. Elks and deer, predominantly shown without antlers, might be female, or male elks during wintertime. Some elks are depicted with their legs detached, and their heads and bodies look like boats. Thus, the meaning of these images might have been polyvalent.

The motifs on the Boyne passage tombs in Ireland indicate relationships mediated by images (Cochrane 2006, 267). Asking what these abstract images ‘meant’ may be the wrong question (cf. Bloch 1995; Cochrane 2005, 2009a; Jones 2006; Cochrane and Jones 2012). We may do better to focus on the effect and the process of repeatedly carving images into the same stones and leaving the potential for similar practices in the future (cf. Gell 1998; Cochrane 2008, 2009a). Many previous accounts interpret these images as signs and tokens that reside in the ‘real’ world, alluding to a hidden cosmological world (e.g. Tilley 1991, 1999; Lewis Williams and Dowson 1993; Lewis Williams and Pearce 2005). Yet these images may express rather than represent—significance is thus based on contextual contingencies of use; it is not a pre-constructed given. So, rather than decode the possible meanings of the rock art in Britain and Ireland, we suggest the utilization of non-textual analogies such as those based in appreciations of performance or artistic production. Unfinished works—such as Michelangelo’s *non finitos* (three-fifths of his sculptures were unfinished: Schulz 1975) or much rock art in Britain and Ireland—effectively create a neurological trick. They create cognitive indecipherability and activate imaginative processes—the spectator is stimulated by the ambiguity of the sculpture and is enticed to try and interpret what is missing or what is happening. These effects work whether one imagines the images as carved into, drawn out of, or passed *along* the stone. It is plausible for rock surfaces to be thought of as semi-permeable and multi-directional. Images on passage tombs and open-air rock art are simulations of interpretations of reality (Cochrane 2006, 2009a). When engaging with any unfinished decorated stone, the viewer will try to determine what is happening: where do the images start and the stone stop? Why are parts of the stone left unfinished and undressed? Is there another trace image below? As such, rock art invites questions that the spectator will often *not* be able to answer. With rock art, ambiguity and hesitation are triggered by the visual puzzles left by the creators of the art.

Across two to three generations, memories of the carving of motifs at open-air panels or at passage tombs may be attributed to particular persons or groups within society, with memories of *why* they were engraved persisting. Over longer periods of time, such as from the earlier Neolithic to the later Neolithic, personal narratives or stories of motif application may have transformed into myths or sagas. These

oral ‘histories’ or myths may have been complex and open to creative and selective re-workings, producing many memories, some real and some imagined, often simultaneously. [Bradley \(2002a, 8\)](#) notes that oral traditions can in some instances become unstable or even corrupt within 200 years. Whittle suggests that these ‘long conversations’ may have incorporated ‘powerful general notions of partiality, fragmentation, contrast and overlap’ (2003, 132). To expand upon this point, we draw upon the recent work of [Cummings \(2002\)](#), who has commented on the similarities between some chambered tombs and natural geological features in south-west Wales and south-west Scotland. She remarks that over successive generations, people may not have distinguished between structures that were ‘original’ and ones created by past generations or mythic entities. Likewise, earlier rock art motifs might not have been ‘remembered’ or considered in the same manner by successive groups. Relationships between people and motifs may have been ambiguous, needing to be constantly worked at or renegotiated, for instance by superimposition. If the superimpositions of motifs were part of processes of remembrance or citation, they create a paradox where the images refer to a possible past but are directed to a future in which it is anticipated that interpretation will be retrospective (see [Bradley 2002b, 122](#)). It is also possible for interpretation to be *ad hoc* and prospective in other circumstances.

CONCLUSION

The rock art of Britain and Ireland was executed over a broad time span from the early Neolithic to early Bronze Age. Whilst the tradition changed over this period one of its curious aspects is the singular lack of representational images. In this sense this practice contrasts strongly with other regions of Europe, including northernmost Europe. We have argued that motifs are ambiguous and that, compared with elsewhere in northern Europe, British and Irish rock art traditions are more closely directed towards activities of *making* rather than *signification*. By focusing on the relationship between rock surface and image, on the unfinished and the uncertain, this tradition might be more concerned with what carving *does* than what it means. These could be ‘images about image making’. Rock art appeals to senses beyond vision (e.g. touch, sound) and sensuous engagements with rock panels (decorated and otherwise) can be further stimulated by the applications of liquids, pigments, and sounds ([Jones 2006](#); [Cochrane 2008](#); [Watson 2009](#)). Because of their abstract and engraved nature, the rock art traditions of Britain and Ireland stand distinct

from other European Neolithic rock art traditions as they are not attempting to carve persons in the world, be it animals, humans, or objects: rather they are making present the act of carving itself. In contrast, the representational art of northernmost Europe has been used to track the identity-making practices of hunter-fisher-gatherer groups in the context of changing long-range networks. The elk was the dominant motif of these communities, stressing the importance of wild animals for them. Nonetheless, among these traditions too we can suppose that the making of motifs was at least as important as the meaning of the motifs themselves and, following the end of the Neolithic in Scandinavia, non-figurative art played an increasingly important role alongside figurative motifs.

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CHAPTER 47

UNDERGROUND RELIGION IN THE CENTRAL MEDITERRANEAN NEOLITHIC

ROBIN SKEATES

INTRODUCTION

FOR central Mediterranean prehistory, the term ‘underground religion’ was first used by [Ruth Whitehouse \(1992\)](#) with reference to the abundant archaeological evidence from cave sites for the repeated performance of rituals, particularly during the Neolithic, between the seventh and fourth millennia BC. This evidence takes various forms, including special deposits of human remains, artefacts, and burnt food residues, placed in and around special features, such as chambers and corridors, fissures, pits and cavities, hearths, springs and water pools, stalactites and stalagmites, dry-stone walls, stepping stones, and mural art. In all these cases, either wild caves or caves previously utilized by human groups were physically and culturally modified to varying degrees.

Italian archaeologists, who have dominated the excavation of these sites, have for some time recognized the ritual significance of caves (e.g. [Grifoni-Cremonesi 1994](#); [Radmilli 1975](#)), although most have valued them primarily as places where deep soundings could be made in order to test and elaborate their traditional relative chronologies, based upon stratigraphic sequences of cave deposits and associated changing artefact typologies. However, British archaeologists have extended the interpretation of ‘underground religion’, particularly since the 1980s, using a range of archaeological and anthropological methods and theories (e.g. [Malone 1985](#); [Pluciennik 1994](#); [Skeates 1991a, 1994, 1997](#); [Whitehouse 1992, 2001](#)). [Ruth Whitehouse \(1992\)](#), in particular, has employed some generalizing approaches to characterize and interpret the development of a distinctive ‘cave cult’ in the south-central Mediterranean Neolithic. But the majority of these studies have adopted a contextual approach, through which the variable spatial, material, historical, and social significance of particular cave sites has been considered in a wider context.

Maintaining this contextual approach, the purpose of this chapter is to emphasize the diversity of the relevant archaeological evidence, beginning with some general comments, followed by a summary and comparison of a selection of archaeological examples and related interpretations from three different regions.

A DIVERSITY OF CAVES

Rather than regarding caves as a unitary category, it is important to begin by emphasizing the diversity of caves in the cultural landscapes of the Neolithic central Mediterranean and the diversity of their human uses. Natural caves, ranging from rock-shelters to relatively small and simple fissures and caves to extensive cave complexes of multiple entrances, corridors, and chambers, are found extensively throughout the limestone regions of the central Mediterranean, from the coasts to interior valleys, basins, and hills, and some (but by no means all) of these were selected for use by Neolithic groups. Significant factors in their selection included: their history of prior human use (in the Upper Palaeolithic, Mesolithic, and Neolithic); their positioning and views in relation to Neolithic cultural landscapes; their local accessibility (or inaccessibility); and their interior shape, size, and natural features.

Different kinds of caves, and different parts of caves, were also used for different kinds of activities, by members of small task groups, kin-groups, or larger village-based communities. Archaeologists have generally interpreted these activities in two ways. ‘Economic’ interpretations have regarded caves either as dwelling places or as seasonal shelters used by mobile hunters and herders (e.g. [Barker 1981](#)). ‘Symbolic’ interpretations, on the other hand, have highlighted the significance of caves as places for the repeated performance of ritual, including human burial and more specialized cult activities (e.g. [Malone 1985](#); [Skeates 1991](#); [Whitehouse 1992](#)). But these two categories do not express the full range of variation evident in the archaeology of caves in the central Mediterranean Neolithic, where many caves experienced long and dynamic life histories. Nor are they mutually exclusive. Distinctions between the rituals of daily life and rituals performed to mark special occasions in the lives of communities, families, and individuals are not always as clear-cut as archaeologists have sometimes assumed. Likewise, contrasts between human activities in caves and in other kinds of place have sometimes been over-emphasized by scholars. Indeed, in the central Mediterranean Neolithic, symbolic deposits and ritual performances in caves incorporated not only people but also a range of material

symbols also used in, and referring to, the wider lived-in world. Nevertheless, some Neolithic cave contexts, such as the Grotta di Porto Badisco in south-east Italy, do stand out archaeologically as having been used overtly and repeatedly for the performance of rituals, which over centuries and millennia led to the accumulation of some distinctive material residues, and contributed to the maintenance and gradual transformation of a long-term (although not necessarily continuous) tradition of cave ritual extending from the Upper Palaeolithic to the Bronze Age and beyond (e.g. [Radmilli 1962](#); [Skeates 1997](#)).

Why certain caves, and why the deepest, darkest, innermost zones of those caves in particular, should have been chosen for and transformed through ritual practices is a key question. From the outside, certain caves could have stood out in the cultural landscape as ancient, permanent, and relatively unchanging physical structures or monuments, helping to demarcate significant boundaries along the margins of the most intensively settled and domesticated agricultural landscapes (as opposed to the wilder, more forested, interiors and uplands of the region). And inside, an awe-inspiring sense of otherness or liminality (particularly compared to the familiar and comforting sense of place associated with the interior spaces of open-air dwelling places) might have been afforded by their relatively cool, humid, dark, and resonant environments, and by the appearance, scale, and feel of their elaborate karst formations. From both perspectives, these caves, and their dark zones in particular, could have been perceived as liminal points of contact or transition between lived-in (or domesticated) and supernatural (or wild) cosmological domains.

Interpretations of rituals that took place within the caves range widely: from votive, sacrificial, and foundation rites, to fertility rites, to rites of passage, including mortuary and initiation rites. However, these general categories fail to express and explain the full variety of ritual practices identified archaeologically in the central Mediterranean Neolithic, not to mention the range of multi-sensory human experiences through which they would have been perceived. This diversity, as well as some shared cultural dynamics, is clearly illustrated by the archaeology of Neolithic caves in a sample of three regions.

THREE REGIONAL EXAMPLES

Abruzzo

In the east-central Italian region of Abruzzo, two groups of known Neolithic cave sites (lowland and inland) exhibit clear contrasts and complementarities to each other and to known open-air sites, particularly in terms of their location, form, cultural material, human uses, and—more specifically—their ritual uses (Skeates 1991a, 1997). In general, these cave sites might best be regarded as extensions of contemporary open-air sites in different parts of the region, extending inland from the Adriatic coastal lowlands to the Apennine intermountain basins and valleys, albeit with slightly more specialized economic and ritual roles, particularly during the later Neolithic.

Half of the known Neolithic cave sites in Abruzzo are situated within the lowland hill zone, between 25 and 40km inland from the Adriatic coast, in fairly inaccessible and hidden locations along the sides of steep river gorges. Examples include Grotta dei Piccioni and Grotta Sant'Angelo. Both are large caves, and both contained deep habitation deposits in their central areas and ritual deposits in their interiors. The latter are characterized by the disarticulated bones, and especially skulls, of children (as opposed to a predominance of adults at contemporary open-air agricultural settlements in the lowlands), scattered over floor surfaces or placed as secondary burials in small stone circles or pits, and accompanied by the residues of food consumption and sacrifice, as well as some special artefacts.

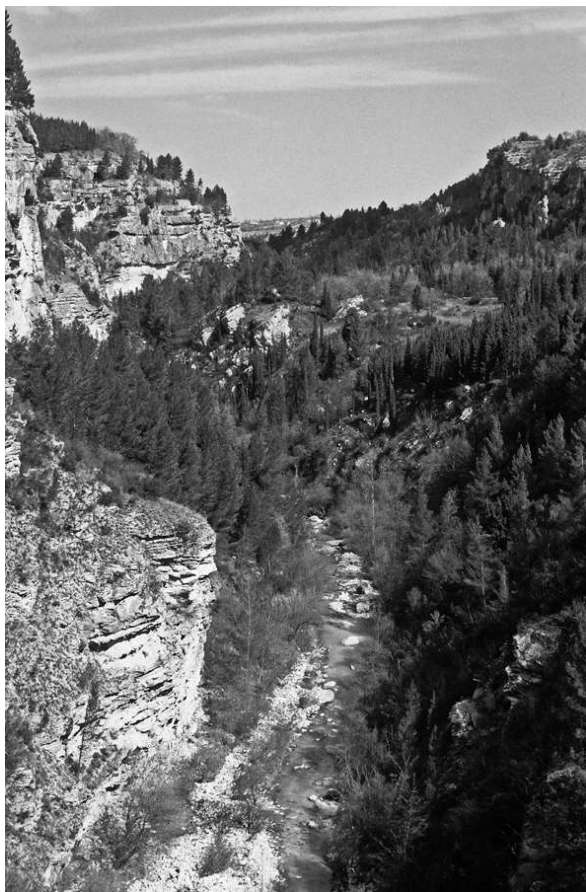


FIG. 47.1. View from Grotta dei Piccioni along the Orta gorge, Abruzzo.

(Photograph: R. Skeates).



FIG. 47.2. Modified triton shell from Grotta dei Piccioni, Abruzzo.

(Photograph: courtesy G. Cremonesi).

Grotta dei Piccioni, for example, lies under an hour's walk from a broadly contemporary final Neolithic open-air village at Piano d'Orta, but is separated from the core zone of Neolithic agricultural settlement in the lowlands by its position high up on the side of the Orta gorge (Fig. 47.1). The earliest evidence of human activity in the cave, radiocarbon dated to the late sixth millennium BC, is represented by an early Neolithic foundation deposit of the articulated body of a

child (Radmilli et al. 1978). Over the next thousand years or so, represented stratigraphically by an accumulation of deposits some 2m in depth containing a succession of hearths and pits and a large quantity and wide range of artefacts and faunal remains, the cave appears to have been used primarily as a dwelling place. Indeed, these material remains are similar in character to those found at open-air sites in the lowlands, with the exception of the relatively high proportion of wild animal species (especially deer) found in the cave. Then, in the late Neolithic, in the innermost and darkest part of the cave, close to the back wall, the remains of four more children were found in a relatively structured deposit in the 'Level of the Circles'. This lay on a large slab of rock, and comprised a line of eleven small circles of stones (30–80cm in diameter), surrounded by a shallow layer of soil containing charcoal and ashes, artefacts of stone, bone, and shell, large quantities of animal bones (predominantly from meat-bearing parts of the body), and fragments of pottery vessels (especially bowls), some of which are likely to have been used in food sharing and consumption. At one end of the line, a stone circle contained the articulated remains of an infant, whilst at the other end two whole child skulls and fragments of a third were left open to view. The largest concentrations of cultural materials were found close to these human remains, including a rare red painted triton shell (*Charonia nodifera*), imported from a distant sea and modified for use both as an object of visual display and as a conch shell trumpet, whose sensory impact would have been particularly impressive if sounded during the course of ritual performances in the cave (Skeates 1991b) (Fig. 47.2). Although ritual themes such as fertility, ageing, death, and the supernatural, spring to mind, no single interpretation can be easily ascribed to these special deposits. One particular interpretation of the rituals, with their combined emphasis on food and human remains, is that they symbolically highlighted a cultural contrast between life and death, and more specifically a concern, expressed in reaction to the threat of death, with the fertility of the living, and of subsistence resources critical to the reproduction of the community. Another approach is to focus on the marginality and secrecy of the cave's location and on the intentionally selected mortuary remains of children, to suggest that these rituals comprised rites of liminality that involved the seclusion and initiation of children into adulthood.

The other group of known Neolithic cave sites in Abruzzo is located further inland, in the intermountain Fucino lake basin. In contrast to the lowland caves, all of the Fucino caves lie within easy access of contemporary local open-air settlements sites, along the lower mountain slopes which flank the southern edge of the basin. All the caves are relatively small and accessible, and may have been used

more narrowly as communal burial places for a relatively large number and (age-) range of deceased individuals derived from indigenous communities with a Mesolithic ancestry based in the Fucino basin, whose remains were deposited during the course of relatively simple mortuary rites.

At Grotta Continenza, for example, early Neolithic mortuary deposits were found both in the exterior rock-shelter and in the interior cave (Barra et al. 1989–90). They exhibited a degree of continuity with a series of Upper Palaeolithic and Mesolithic levels which contained human burials, pieces of red ochre, and shell and bone ornaments, as well as occupation deposits containing faunal remains and stone artefacts indicative of a relatively sedentary complex hunter-gatherer group. Throughout the Neolithic deposits, the remains of some 15 adults and 15 children were found as articulated bodies in graves or scattered as disarticulated bones. In the rock-shelter, the articulated bones of two children were placed in a niche in the central wall, whilst the cremated remains of another two children and one adult, together with a small quantity of red ochre, were deposited inside and on top of a group of intact pottery vessels positioned along a side wall. And in the interior cave, with its low ceilings and stalactites, some circles of stones and pits, and the articulated skeletons of two sheep and a dog, were found. The latter might be interpreted as sacrifices of valued (and novel) domestic animals, offered as reciprocal gifts to ancestral or supernatural inhabitants of the underworld by members of an inland early Neolithic community that still engaged in traditional hunting and gathering. More generally, the religious significance of the Neolithic mortuary rituals performed in Grotta Continenza might be interpreted in two ways. On the one hand, ritual participants may have been concerned, in the face of death, with the promotion of the health, fertility, and nutritional welfare of a group in transition between a traditional hunter-gatherer economy and an agricultural lifestyle. On the other hand, the repeated performance of rituals within the cave, and its establishment as an ancestral burial place or monument, might have helped leaders promote an ideal of group unity and continuity amongst an indigenous social group that may (in the early Neolithic) have remained relatively mobile and fluid.

Puglia

In the south-east Italian region of Puglia, two broad groups of Neolithic caves and related open-air sites can also be distinguished: one in the north, associated with well-established agricultural communities settled on and around the Tavoliere Plain; the other in

the centre and south, associated with more transitional early farming communities exhibiting stronger continuities with the indigenous culture of the final Upper Palaeolithic/Mesolithic. In fact, stratigraphic continuity between final Upper Palaeolithic/Mesolithic and early Neolithic occupations has been claimed by the excavators of some caves in the centre and south. Nevertheless, the human uses of caves throughout this region were transformed significantly over the course of the Neolithic. Indeed, as social life became more complex and potentially stressful in Puglia, ultimately due to the full adoption of an agricultural lifestyle and the establishment of an increasingly widespread and competitive system of social interaction and exchange, increasingly formalized cave rituals may have been used to express and confront these social and economic tensions, with particular reference to old and new social and cosmological orders.

All of the Puglian Neolithic cave sites appear to have been located on, and may therefore have contributed to the definition of, the margins of the agricultural landscape. However, the underworld was never far removed from contemporary open-air sites and the mainstream of agricultural life (Skeates, in press). In the south, for example, contrasts and connections can be drawn (as in Abruzzo) between occupied Neolithic caves and open-air sites, and between different caves (Skeates 1994). The open-air sites are all situated in the lowlands, generally within a few kilometres of the sea. They can be interpreted as small homesteads or villages, composed of houses and related structural features (including primary and secondary burials), in and around which mixed farming was practised, as well as some hunting and fishing. The cave sites, by contrast, are situated marginally in relation to the open-air sites, either on the coasts or inland, along the edge of the uplands. They can be interpreted as having been used as sheltered bases for subsistence strategies that involved more herding, hunting, and gathering than the mixed farming of the open-air sites, and as liminal places for the performance of rituals. Compared to the open-air sites, a slightly larger quantity and range of special objects was deposited in the caves, including stone lamps; small polished greenstone axes; a wide range of perforated sea shell ornaments; pieces of red ochre; a small bird-shaped shell figurine; a smoothed boar's tusk; a clay stamp (or *pintadera*); the articulated leg bones of a cow in a pit in the interior part of Grotta delle Venere; and decorated pottery (including pottery vessels deposited in a water pool in Grotta della Zinzulusa, or placed under stalactites in Grotta di Porto Badisco and Grotta Santa Maria).

Around the entrances of caves in Puglia, deep occupation deposits often accumulated, suggesting that many of them served a convenient residential function as shelters. Cereals and domestic animals were

certainly consumed in them, if not actually produced in the immediate vicinity, but local resources were also exploited, including a greater range and quantity of wild fauna compared to open-air sites.

In the interiors of these caves, special deposits often accumulated. They are characterized by the presence of human remains, pits, hearths, large quantities of carbonized grain, selected animal bones, pottery fragments, and other artefacts, some with a high symbolic value. They might be interpreted as residues from the performance of mortuary rites accompanied by food consumption, as well as the ritual sacrifice of valued objects. They are comparable to the mortuary deposits identified at some contemporary open sites, save for the fact that (as in Abruzzo) infants and children, and also women, were buried more commonly in caves—a practice which may have contributed to the construction of a distinct social status for them compared with that of adult males.

A prime example is Grotta Scaloria ([Quagliati 1936](#), 118–144; [Tinè and Isetti 1975–80](#); [Winn and Shimabuku 1980](#)). This cave is located accessibly, on the boundary between the Tavoliere Plain and the Gargano uplands. The cave system comprises two main chambers. Scaloria Alta is the large upper chamber. It extends over an area of 80 by 100m, and has a 2m high ceiling. This space was used as a burial chamber throughout most of the sixth millennium BC. The primary and secondary burials of 137 individuals were discovered here, particularly in the innermost part of the chamber, in groupings of around 20 individuals. Most were identified as young people, aged below 15–20 years, but some older adults, aged up to 49 years, were also present, and females outnumbered males here by a ratio of two to one. Some were directly associated with grave goods, including a deer antler placed behind the head of a young man, a pair of boar's canine pendants decorated with fine geometric incisions associated with the body of an old adult, and a possible skull-cap represented by a disarticulated skull covered by numerous shiny tubular shells. These buried individuals presumably belonged to local families based in one or more of the large, nucleated, agricultural ditched villages that developed in the densely settled northern half of the Tavoliere Plain during the later Neolithic.

The deep interior spaces of large cave systems, with extensive underground complexes of chambers and corridors, were also elaborated through the formation of more specialized ritual structures and deposits. Here, Neolithic visitors exploited and added to the existing natural morphologies of the caves (including their walls, passages, floors, fissures, stalagmites, and water pools), inheriting and reinventing a traditional way of perceiving and ritually elaborating caves previously established in the Upper Palaeolithic in Puglia

(Skeates 2005). In the process, they created some powerful new forms of sacred space.

Scaloria Bassa, the lower chamber of Grotta Scaloria, provides an outstanding example from north Puglia. This wide chamber is reached via a narrow and low gallery and terminates in a small lake. It was used in what has been described as a water cult (Tinè and Isetti 1975–80; Whitehouse 1992). A rectangular basin was carved in the centre of the chamber, apparently to collect water dripping from the stalactites on the roof. Around this were found 70 middle Neolithic fineware vessels, some still whole. All of these lay close to truncated stalagmites, some even on top of the base of broken stalagmites. Traces of a large hearth, with the remains of partially burnt animal bones (radiocarbon dated to the second half of the fifth millennium BC), were found close to the basin. A primary burial, a skull, and some other human bones were also placed in natural fissures in the lower cave. Here, one might suggest that rituals may have expressed tensions over water and death, which might have related to specific agrarian concerns over the health, fertility, and productivity of people and their agricultural resources on the adjacent Tavoliere Plain.

Further south, a pair of elaborately decorated cave complexes are known in the Salento peninsula, near Santa Cesarea Terme. The best-known is Grotta di Porto Badisco (e.g. Graziosi 1980; Guerri 1993; Lo Porto 1976). The cave is located at the top of a low hill slope, overlooking a small coastal inlet (Fig. 47.3). Its location today is visible and accessible, and in the later Neolithic it would have lain within easy reach of contemporary open-air sites, indicated by the presence of later Neolithic pottery on the adjacent plateau. However, its simple entrances give no indication of the great extent, complexity, and (in some parts) inaccessibility of this underground system, with its four main branching corridors, extending over a total distance of around 850m. The morphology of these corridors varies from relatively large chambers (6–10m wide) to restricted passages, some sections of which are only negotiable by crawling.



FIG. 47.3. Porto Badisco, Puglia. The cave entrances are located by the white building on the hilltop.

(Photograph: R. Skeates).

The complex was first occupied and ritually elaborated during the Upper Palaeolithic. Cultural deposits of this period include a few faunal remains, stone artefacts, and objects decorated with final Upper Palaeolithic Romanellian-style incisions and red ochre. Parietal art was also produced in the cave at this time, in the form of a series of incised geometric motifs.

The cave was then reoccupied during the middle Neolithic (from the mid-sixth millennium BC). At this time, numerous pits were cut into the Pleistocene deposits in the eastern entrance chambers. These were then filled and overlain by a rich cultural layer of soil, containing ashes, some quite sizeable deposits of carbonized seeds, a few bones, stone artefacts, and pottery fragments.

The human use of Grotta di Porto Badisco then became overtly ritual during the later and final phases of the Neolithic. In the entrance chambers, similar but richer deposits continued to be laid down, containing more abundant animal bones, piles of carbonized cereal grains associated with grindstones, hearths, ashes, fragments of fine-ware, a ceramic ladle, a clay stamp, a pair of unusual combined spatula/awls, and some finely flaked flint arrowheads and daggers. Human remains were also deposited here for the first time, including some crouched bodies covered by a pile of stones, and a human skull and three vertebrae placed between the two inner entrance cavities. Additional mortuary deposits extended from the eastern entrance

chambers, along one tunnel, to the end of another tunnel. Some spaces in the cave were also modified, perhaps especially to facilitate and control bodily movements through different parts of the cave system. Steps were cut into the deposits filling the entrance passage. Part of the second corridor, and some natural circular cavities in the cave floor, may have been artificially widened. Stepping stones were laid across a pool of drip water, and simple dry-stone walls were constructed.

But the best-known features of this cave system are the Neolithic wall paintings, which were concentrated along three of the main corridors, in 12 morphologically distinct zones. The paintings have black-brown and red pigments, derived from bat guano, a rich deposit of which exists in one part of the cave, and red ochre materials (Cipriani and Magaldi 1979). The paintings are dominated by figurative hunting scenes, involving human and supernatural (half human/half animal) participants as well as deer and dogs. But there are also hand-prints and more abstract geometric and curvilinear motifs, many of which can be compared to middle and late Neolithic painted ceramic decoration in Puglia. These paintings accumulated over time, as indicated by the replacement of faded images and the overlapping of some of the abstract motifs. Nevertheless, according to statistical analyses of the distribution of particular motifs, a degree of spatial patterning was established along the painted corridors, partly with reference to gender (Albert 1982; Graziosi 1980; Whitehouse 1992). The sex of the human figures is not always explicitly marked, but where it is figures exhibiting a hands-on-hips posture are commonly depicted as female by the addition of a blob of dark paint in the pubic area, whilst archers and a horned figure are represented as male by the depiction of the penis. A degree of male bias is evident numerically: of the 14 sex-specific human figures, two-thirds are male whilst one-third is female. Furthermore, the female figures are concentrated exclusively in the central chamber of the cave system, where the entrance sector of the complex culminated, whilst the male figures also occur further along the successive corridors, together with increasingly abstract symbols. The group of around 100 handprints situated half way along the second corridor on the ceiling and wall is also worth mentioning. Ruth Whitehouse (1992) has plausibly suggested that these patterns may have been produced and inspected during the course of initiation rites into the secret phases of a male (deer) hunting cult involving elders and junior initiates, from which women were excluded. She has also highlighted the multi-sensory and emotional dimensions of such rites, with reference to themes such as access, movement, sound, touch, darkness, strangeness, secrecy, fear, and sensory deprivation (Whitehouse 1992, 2001). More generally,

the repeated deposition of burnt offerings of crops in the cave entrance and the combined symbolic emphasis on wild deer hunting and on gender (and age) might be interpreted in terms of ritual performances that expressed fundamental tensions within an indigenous group with a hunter-gatherer ancestry surrounding their full transition to an agricultural way of life, including a more strongly gender- and age-based division of labour ([Skeates 2012](#)).

Partially or entirely artificial ritual caves also began to be constructed in Puglia during the late and final phases of the Neolithic, particularly (but not exclusively) for the purposes of human burial and the performance of associated rites, which involved the sacrificial consumption of food and of some valuable portable artefacts. These developments might be interpreted in terms of the establishment, through rituals performed in significant liminal places in the cultural landscape, of even stronger reciprocal relations between members of particular living kin-groups, their ancestors, and the supernatural.

At Grotta di Cala Colombo, for example, situated on the Adriatic coast near Torre a Mare, the walls of a natural cave entrance appear to have been enlarged artificially in the final Neolithic to form an elaborate multi-cellular burial chamber ([De Lucia et al. 1977](#)). This contained stratified mortuary deposits, which reflect an increasingly intensive mortuary use of the cave, especially between around 4200 and 3650 BC.

In the case of the 'Manfredi hypogeum', located at Santa Barbara near Polignano a Mare, an entirely artificial underground structure was dug into the limestone bedrock from the inner side of a late Neolithic village enclosure ditch ([Geniola 1995](#)). It is 9m long and has a symmetrical plan. A sloping access ramp leads to two chambers, linked by a short central corridor with a square section and a step in the floor. Deer skulls (echoing the deer symbolism of Porto Badisco and Scaloria Alta) were arranged along the walls of the access ramp and first chamber, whilst small niches and a cross-shaped symbol were engraved in the walls of the second chamber. The structure contained a stratified deposit, radiocarbon dated to the first half of the fifth millennium BC, with animal bones (dominated by roe deer), small piles of limpet shells, decorated ceramic jars and cups, and artefacts, perhaps derived from ritual hunting and feasting, whilst a small trench containing a deposit of human bones was also found in the back room.

An early example of an entirely artificial 'rock-cut tomb' was also established at this time at Arnesano ([Lo Porto 1972](#)). It comprised a small cylindrical chamber with an access pit dug into clay and sand. The pit was sealed by a limestone slab. Within the tomb, the body of an adult had been laid on the floor of the chamber, in a crouched

position. Grave goods were placed on one side of the body, including three pottery vessels and a stone 'idol' that combines an overall phallic form with the carved representation of a possibly female head and necklace (Whitehouse 1992, 166). Although, traditionally, scholars have sought long-distance origins for this form of burial, a variety of prototypes for this form of tomb can be identified in the late Neolithic of Puglia (Whitehouse 1972; Skeates 2005, 2012). More specifically, the construction of this tomb (and other contemporary mortuary deposits) might reflect a growing concern with defining and fixing the status of selected deceased adult individuals, particularly as prestigious members of extended kin-groups, accompanied by some valuable and symbolic goods, in slightly more formalized sealed deposits placed in more laboriously constructed tombs, situated in significant places in the landscape.

Malta

The limestone islandscape of the Maltese archipelago contains a large number and variety of natural cave formations. As in Italy, a selection of these caves were used and modified during the Neolithic, alongside the occupation of open-air homesteads or villages (Skeates 2007, 2010).

A few relatively large and accessible caves were occupied in the early Neolithic (from around 5200 BC), when the Islands were intentionally colonized by groups of farmers from southern Sicily, for whom cave use was already a long-established cultural tradition. Neolithic deposits in these caves contained hearths, trampled earth, fragments of pottery vessels, tools, body ornaments, animal bones, and mollusc shells. Archaeologists have generally interpreted these remains in terms of the use of caves as convenient dwelling places by newly arrived Neolithic settlers (e.g. Bonanno 1987). Certainly, the locations of these cave-sites suggest that they were good places to live in and around, offering commodious and permanent shelters, with physical and visual access to adjacent freshwater springs, fertile agricultural soils, valleys, and natural harbours. Nevertheless, there is also evidence that small-scale rituals were performed in the interior of Ghar Dalam (Fig. 47.4). This cave opens off the side of a narrow valley, and extends as a straight tubular passage some 144m into the overlying hill. A special deposit was found 34m in from the cave entrance, below a cluster of stalactites that demarcate a natural zone of transition between the relatively light outer and dark interior sections of the cave. It contained traces of burning, some disarticulated human remains, animal bones, decorated pottery fragments (including two broken zoomorphic vessel handles), a

miniature and polished greenstone axe-blade, two finely made bone awls, three perforated dog teeth, and some sling-stones (Despott 1918, 220). This assemblage might be interpreted as a special, symbolic, deposit of things placed in the liminal zone of the cave, which might have been perceived as an ambiguous boundary and point of contact with chthonic forces. Its deposition might also have contributed to a cultural process of defining the boundaries of newly domesticated parts of the Maltese islandscapes.



FIG. 47.4. Stalactites and stalagmites in Ghar Dalam, Malta. (Note Giuseppe Despott's initials engraved on the right-hand wall.)

(Photograph: R. Skeates).

Ghar Dalam continued to be occupied throughout the Neolithic. However, a notable development in the fourth millennium BC final Neolithic was the construction of small clusters of artificial rock-cut tombs, carved out of the soft Maltese limestone, and repeatedly filled with ochre-stained 'collective' deposits of human remains accompanied by faunal remains and some special artefacts. Although it has been argued that these structures may have originated locally out of an attempt to reproduce natural caves (Evans 1955–6, 56), in the context of the Maltese final Neolithic Żebbuġ culture it seems more likely that they represent innovations connected to, and influenced by, contemporary people elsewhere in the central Mediterranean. These tombs were situated in prominent locations: away but not far from contemporary settlements, on the sides and crests of hills. Their significance might be interpreted in terms of a

growing social concern with defining the (separate) place of the dead, caring for them, and maintaining good relations with them as ancestral members of enduring kin-groups. Mortuary rites were performed in sanctified ancestral places, set apart from but overlooking the domestic landscape, which provided reference-points for establishing and remembering the distinct histories and territories of those groups.

Archaeological excavations at the Xaghra (or Brocktorff) Circle rock-cut tomb have revealed some specific details of the ritual process (Malone et al. 1995). In Chamber 1, an initial foundation deposit of valued artefacts was placed at the very back of the tomb. In both chambers, the mortuary deposits then appear to have been formed by the repeated placing of individual corpses and accompanying domestic animal bones (especially the skulls and mandibles of sheep or goat), body ornaments, broken pottery vessels (a few decorated with schematic anthropomorphic figures), and a few stone artefacts, in spaces close to the tomb entrance, cleared by pushing aside the remains of previous inhumations. The buried individuals comprised a minimum number of 54 adults, 15–28 adolescents and children, and one infant. All of the deposits were stained with a large quantity of blood-red ochre, probably imported from Sicily. The entrance hole of Chamber 2 was sealed by wedging a stone slab against it, whilst an eroded and slightly damaged stone ‘idol’, with a schematic human face marked by incisions and drill-holes (comparable to that found in the Arnesano rock-cut tomb in Puglia), was found directly beneath this entrance, where it may have fallen when the tomb was reopened during the successive Temple Period, presumably having previously marked and guarded the entrance to the tomb.

CONCLUSIONS

In this chapter, I have emphasized the malleability and diversity of caves in the central Mediterranean Neolithic as cultural constructs and as places of religious belief and practice. These caves were certainly durable, but they were not as fixed as they may have appeared. Their powerful physical forms, and their cultural significances, together with human uses and experiences of them, were modified by dynamic natural processes and human interventions before, during, and after the Neolithic. Diverse meanings and values were ascribed to these caves over space and time. As dwelling and work places, for example, they framed everyday practices and cultural ideals. And as sacralized places and as ritual boundaries, they offered plentiful creative opportunities to imagine, express, and mediate a wide range of

religious ideas about human relations, identities, and cosmologies: within and between social groups, with nature and the supernatural, with death and the ancestors, and with the past, present, and future. Physical and intellectual access to their potent, multi-sensory, heritage of natural and cultural resources was also sometimes selectively controlled (perhaps even contested) in the deployment of secular and political authority in ritual performances. In other words, we can, with some justification, continue to acknowledge the development of one or more somewhat distinctive sets of underground religious beliefs and practices in the central Mediterranean Neolithic of a loosely defined 'underground religion' (despite the limited attention given by scholars to contemporary above-ground religion). But we must also accept that, throughout this process, caves remained connected by people to broader cosmological orders, lifeways, and landscapes, albeit on their margins.

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CHAPTER 48

A PLACE IN THE COSMOS

Celestial Bodies and the Passage Graves of Western Europe

MICHAEL HOSKIN

DID ASTRONOMY FEATURE IN THE *COSMOVISIÓN* OF THE NEOLITHIC?

THE Spanish word *cosmovisión* has no exact counterpart in English. It is more nuanced than ‘cosmology’, more comprehensive than ‘world picture’; it expresses the overall context—both celestial and terrestrial—in which humans see themselves as living out their lives. In this chapter our concern is whether the sky, and in particular the heavenly bodies, played a role in the *cosmovisión* of the various Neolithic peoples of western Europe—and if so, what form this role took.

A generation ago it was argued that there was a science of astronomy in the British Isles during Neolithic times. [Fred Hoyle \(1971\)](#) and [Gerald Hawkins \(1964\)](#) claimed that Stonehenge was an astronomical computer. What they were really saying was that they, as twentieth-century astronomers and mathematicians, could have used the stone circles to calculate future eclipses and the like; but this was no proof that the builders of Stonehenge in fact used it for this purpose, and after a flurry of publicity their ideas were discarded.

A much more extended campaign aiming to show that a true science of astronomy existed in Neolithic Britain was advanced about the same time by [Alexander Thom \(1967, 1971; Thom and Thom 1978\)](#), a Scots professor of engineering at Oxford University. Thom was concerned above all with the motives that had led to the erection of the mysterious stone circles that are so numerous in his native Scotland. He carefully surveyed great numbers of these, so bequeathing valuable factual evidence to future investigators ([Thom et al. 1980, 1990](#)). He claimed there was a standard unit of length employed by the constructors all over the country, the *megalithic yard* ([Thom 1955](#)), although sceptics noted that this is remarkably close to

the pace of the average adult male. More importantly, [Thom \(1971, 11\)](#) became convinced that the circles had been built so that ‘Megalithic man’ might predict future eclipses of the moon.

How could they have done this? As the sun shines on the earth it casts a shadow, and an eclipse of the moon occurs when the moon enters this shadow. Therefore, to predict a lunar eclipse, an earth-dweller must have an accurate knowledge of the cycles of both sun and moon, and the mathematical skill to see how these relate to each other ([Ruggles 1999](#), 24–25, 36–37).

The cycle of the sun as we see it in the sky is simple enough, but it is difficult to pin down with accuracy. At midsummer the sun rises around north-east (the exact position depending on the observer’s latitude), and for a few days the position of sunrise alters little (hence our term ‘solstice’). Then we begin to notice the sun rising each morning a little further to the south, and as autumn approaches the rate of this daily change increases. At what today we term the equinox, the sun rises close to due east and the daily change in the position of sunrise is at a maximum. Then, as winter draws on, the change slows down, and eventually comes to a stop at the winter solstice. For the next six months, the cycle is reversed; and so on.

The problem for the observer of the solar cycle is that for a week or so either side of a solstice the sun rises in almost exactly the same place, the change from one day to the next being almost imperceptible. As a result, it is very difficult to determine the day of the solstice itself—and yet knowledge of the exact day is an essential element in any calculations involving the cycle of the sun. In the seventeenth century Galileo suggested that this problem might be solved by observing the sun each evening around solstice as it sets behind a distant mountain. If the mountain is, say, 10km away, then nature has helpfully provided us with an observing instrument 10km in size and so of great accuracy. Even if sunrise occurs in *almost* the same place on successive days, at a distance of 10km it should be possible to detect the tiny changes that are in fact taking place. Thom did not know of Galileo’s proposal, but he came to the conclusion that this was exactly what Neolithic man had done: the location of a stone circle (he believed) had been chosen so that, around a solstice, people in the circle would see the sun rising or setting behind some distant mountain, and by careful observations spread over several days they would be able to determine the exact day of the solstice.

Thom sought to buttress his argument by showing that many stone circles were indeed positioned in just the required relationship to a distant mountain, one that had a suitable notch or whatever to facilitate the observations. But others suspected that Thom would arrive at a stone circle determined, as he scanned the horizon, to find

a mountain in one of the directions anticipated by his theory. And so, in 1980, the Cardiff archaeologist Richard Atkinson secured a grant for fieldwork to test this suspicion. If objective criteria were established for what constituted an horizon feature of the appropriate type, would Thom's chosen mountain be exceptional in satisfying the criteria when viewed from the circle?—or would it be only one of many such mountains in the surrounding skyline, singled out by Thom because it suited his hypothesis? A young astrophysicist, Clive Ruggles, was recruited to carry out the fieldwork, and his conclusion was unequivocal (1999, 49–67): Thom had typically selected his chosen mountain from among innumerable candidates because it lay in one of the desired directions. Since that time, Thom's theories have been in decline, and few today believe there was a *science* of astronomy in Neolithic Europe.

But did the heavenly bodies play a role in the *cosmovisión* of Neolithic peoples? And if so, what clues can we expect? Unfortunately, interest in some celestial phenomena would leave little or no trace in the archaeological record. For example, the agricultural calendar described by Hesiod around 700 BC depends upon 'heliacal risings' (and even today there are parts of Europe where farmers continue to sow and harvest by such a calendar). As the sun makes its annual circuit of the stars, there will be a few weeks during which the sun is so close to a particular star that the star is lost to human eyes in the glare of sunlight. Then the time comes when the sun has moved far enough from the star for the star to be seen again, albeit briefly, in the dawn sky. This is the star's 'heliacal rising'. According to Hesiod, farmers were using a succession of heliacal risings to mark the stages in the agricultural year, but how would we know this archaeologically?

Hesiod was of course drawing on the experience accumulated by farmers over centuries, and—surprisingly—there is evidence that at around 3000 BC heliacal risings were the occasion for festivals in a temple in Crete (Hoskin 2001, ch. 3). The oldest of the three temples that make up the complex site of Mnajdra, Malta, has a pair of entrance pillars, and on these pillars are drilled rows of holes that are surely tallies. But of what? What number counts were so important as to warrant being recorded on a sacred site? Analysis of the numbers themselves suggests that they may well represent the days between one important heliacal rising and the next, beginning with that of the Pleiades; and if so, festivals were presumably held to mark these risings.

There are other celestial phenomena which, if they played a part in the *cosmovisión* of the builders, may well have left more obvious traces in the archaeological record. We have an encouraging example of this

in Christian churches, which were traditionally oriented to face the rising sun (on a day of the year selected by the builders), as the symbol of Christ rising from the dead. Stonehenge is a monument whose alignment to the midsummer sunrise and midwinter sunset is well known (Ruggles 1999, 35–41). Newgrange in Ireland, where around midwinter the rising sun penetrates to the innermost recesses of the tomb, is equally famous (Ruggles 1999, 12–19). But we should allow for the possibility that these alignments in fact occurred by pure chance, and that the astronomical interpretation we give them is a modern fabrication. To be sure of any such interpretation, we need a statistical argument—a consistent pattern of orientation in a large number of such monuments. If Newgrange were one of many tombs in the region, all of which faced midwinter sunrise, we could argue with some confidence that this was the motive in the minds of the builders.

WHAT IS ARCHAEOASTRONOMY AND WHAT DO ARCHAEOASTRONOMERS DO?

The discipline that investigates such possibilities is known as ‘archaeoastronomy’, but this term is unfortunate for it gives the misleading impression that only explanations in terms of astronomy will be accepted. The archaeoastronomer visits Neolithic (and Bronze Age) monuments whose orientations are well defined, and measures these orientations (Fig. 48.1). Passage graves form the bulk of such monuments. Not all have a well-defined orientation: in Catalunya there are a handful of graves where access is from above; in the French *causses* there are coudé tombs where the passage is at an angle to the chamber; and in Brittany there are passage graves where the passage describes an arc and others where the passage is at a right angle to the chamber. But these are exceptions: with the overwhelming majority of passage graves in western Europe, the orientation is unambiguous. In the simplest cases, the archaeoastronomer measures the mid-point of the backstone, and puts a pole there; he or she then measures the mid-point of the passage, puts a pole there too, and with suitable instrumentation measures the orientation of the line joining the two poles.



FIG. 48.1. Measuring the orientation of one of the tholos tombs at Los Millares, Almería, Spain.

If it is suspected that astronomy may be part of the explanation for the choice of orientation, the archaeoastronomer must also measure the apparent altitude of the skyline in the direction of the orientation. This is because (in the northern hemisphere) the sun and the other heavenly bodies move south as they are rising, and so if the sun, for example, has to climb behind a hill before it can be seen, when it does appear it will be further south than if the hill had not been present.

Very occasionally a passage grave is one of a kind. At the great site of Antequera in southern Spain there are three massive graves, each of a different construction ([Hoskin 2001](#), 68–71), and one of these—Dolmen de Menga, built around 3000 BC—faces north-east, an orientation rarely seen in Iberia. The visitor soon becomes convinced of the motive, for a few kilometres to the north-east is the extraordinary mountain known as La Peña de los Enamorados, which has the uncanny and awesome appearance of a sleeping giant. But usually a passage grave is one of numerous examples in the countryside, and the archaeoastronomer must measure the orientations of as many of these as possible in the given region. The next question is, were the orientations chosen at random, or were the builders following a custom? In every instance known to me, with the minor exception of the *sesi* tombs of the island of Pantelleria in the Strait of Sicily, where multiple tunnels lead to an interior chamber (see [Hoskin 2001](#), 200–202), we find that the builders were indeed

following a custom.

We must then ask whether our data will allow us to establish the motivation underlying the custom. The royal tombs of Mycenae simply faced downhill. Islamic mosques—in theory at least—face towards the terrestrial ‘target’ of Mecca. In County Sligo, Ireland, the graves face towards the great cairn on top of Knocknarea. So we do not lack for examples of builders who followed a custom whose motivation had nothing to do with astronomy.

How then can we satisfy ourselves that the custom called for an orientation towards a heavenly body? If we are dealing with passage graves confined to a limited geographical region, we may have suspicions but no proof—tombs facing in a given direction might be oriented on the rising of the Pleiades, but they might also be oriented on a distant sacred mountain. But if the custom is spread over a wide area, we can be confident that only by using the sky could the builders have articulated the custom.

If the custom was indeed related to what is to be seen in the sky, what possibilities should the archaeoastronomer consider? We must disregard the planets, for their rising and setting points follow patterns so complex that if a group of passage graves were directed towards a planet, we would have almost no hope of discovering this. But what of the sun, moon and stars? The range of sunrise today extends a certain number of degrees north and south of due east, and that of sunset extends similarly north and south of due west (the extent of the range depending on the latitude). In the Neolithic the ranges were greater, but only marginally so, and for most purposes the change over the millennia can be ignored (hence the midwinter sunrise still penetrates Newgrange). The range of moonrise is (and was) similar, but extended a few degrees further in each direction, so that there can be graves that sometimes faced moonrise but never faced sunrise.

If a passage grave faced southerly, it would never have faced the rising or setting of the sun or moon, but it would have faced these bodies each day when they were in the sky. But if a passage grave faced northerly—very roughly, between north-east and north-west, directions in which the sun and moon are never seen—and its target was astronomical, this target could only be a star.

This however would be very difficult for the investigator to establish with confidence, because there are innumerable stars, and one or more will be seen rising or setting in almost any given direction. But even if we restrict ourselves to the very brightest stars, we have the further problem that the rising and setting points of any particular star change significantly over the centuries. This is because the gravitational pulls of the sun and moon on the earth (which is not a perfect sphere) cause the axis of the earth to wobble. As a result the

position of the North Pole in the sky is constantly changing, and so the stars visible from any particular location on earth change too. These changes, which are fully understood, have important consequences for the archaeoastronomer. For example, the present writer has argued that the Bronze Age taula sanctuaries of Menorca were designed to face the Southern Cross ([Hoskin 2001, ch. 4](#)). Astronomy tells us that the Cross was visible when the sanctuaries were built, a millennium or so before Christ, although it has long since disappeared from sight of the islanders.

The changes in the rising and setting of the stars pose a fundamental problem for the archaeoastronomer who suspects a passage grave was built to face in the direction of (say) the rising of a bright star; for by suitable choice of the supposed date of construction, it may well be possible to make the coincidence between the orientation and the rising position of the star exact. With so many stars to choose from, and so little known about the exact century of construction of a passage grave, it is usually so easy to 'orientate' a monument on a star that the exercise is meaningless.

Fieldwork reveals that in western Europe it is in fact almost unknown for passage graves to face northerly, outside the range of moonrise (and of course sunrise). It is therefore most unusual for a star to be proposed as a convincing target for a dolmen's orientation. But there is one plausible example. At Valencina de la Concepción, to the west of Seville, the remarkable Dolmen de Matarrubilla has a perfectly straight and uninterrupted corridor an astonishing 37m in length, giving a glimpse of sky (but no more) to the prehistoric observer in the chamber; and it is difficult to believe that the orientation of a corridor so long and so straight was of no interest to the builders. Most exceptionally, the orientation is $17^{\circ}48'$, far to the north of places on the horizon where the sun, moon and planets rose. If therefore it has an astronomical target, it must be a star, and the only bright star that rose anywhere in that direction was Arcturus, the third brightest in the sky as seen by the builders. Because of the exceptional accuracy with which the orientation is known, we can calculate that Arcturus was visible from the chamber only in the years immediately before 3100 BC, assuming of course the tomb existed at that time. Archaeologists confirm that the thirty-second century BC is very possibly the period for the construction of Matarrubilla; but unfortunately they cannot be more precise. In this most exceptional case, then, archaeoastronomy can confirm that *if* the orientation of the tomb was astronomically motivated, it was built to face the rising of Arcturus in the thirty-second century BC ([Hoskin 2001, 77–80](#)).

This brings us to the sun and the moon, both of whose cycles must have been of the greatest significance in daily life. The seasonal (solar)

calendar was fundamental to the growing of crops, and for people with limited artificial light the brilliant illumination from the full moon at night must have contrasted strikingly with the darkness at the opposite end of the monthly cycle. The role that the sun and moon played in religious practice must surely have been very great, and to the archaeoastronomer each comes with good credentials. We have seen that churches are commonly oriented on sunrise, and Strabo tells us of tribes in the north of Spain who in Roman times danced all night in front of their homes to celebrate each full moon.

The range of sunrise is virtually the same from one year to the next. The behaviour of the moon, however, is much more complex. The range over which the moon rises each month varies over a cycle that lasts a little over 18 years. If at a given time the range is at a maximum, extending from some five degrees north of midsummer sunrise to some five degrees south of midwinter sunrise, then nine years later the range is at a minimum, with its limits now five degrees short of the sunrise limits at either extreme. Archaeoastronomers term the maximum limits the 'major lunar standstills' (or the 'major lunastices'), and the minimum limits the 'minor lunar standstills' (or the 'minor lunastices').

At a major lunar standstill, the moon rises well outside the range of sunrise, and it is to be seen rising in such directions only at intervals of a generation or so. One can well imagine that moonrise at such almost unprecedented positions on the horizon would have seemed remarkable. At a minor lunar standstill, however, the moon rises at positions where it rises every month, the only singular feature being that it (so to speak) refrains from rising outside this minimal range. This can strike the modern mind, trained in geometry, as worthy of note, but whether Neolithic people found it remarkable is open to doubt.

The sun is always a luminous disc, but the moon of course varies from the disc of the full moon to a tiny crescent (and even invisibility) around the time of new moon. We have seen that a passage grave facing sunrise necessarily faces moonrise, and for those archaeoastronomers (including the present writer) who favour a solar explanation for orientations, the situation is simple. Neolithic grave builders would have been well aware of the range of sunrise, and especially of the position of midwinter sunrise, for the days were then getting shorter and shorter, and colder and colder, and unless the sun reversed its course death would inevitably follow for humankind. The archaeoastronomers who favour a lunar explanation, on the other hand, have both major and minor standstills at their disposal but, more importantly, have a choice of phases of the moon—most plausibly full moon—and may focus on the full moon that occurred at

a particular time of the solar year. Easter, for example, is related to the full moon (a lunar event) following the spring equinox (a solar event). The opinions of respected archaeoastronomers are therefore divided between those who favour a simple solar explanation, and those who employ one of the more complex and more flexible lunar explanations. At present the debate continues and the outcome is unclear; but as the solar explanation is so much simpler to express, we shall adopt it in what follows ([Hoskin 2001](#), 213–216; [Belmonte and González García 2010](#)).

MEASURING THE PASSAGE GRAVES OF WESTERN EUROPE

Of all the passage graves of western Europe, the most instructive for our purpose are the seven-stone graves of the Alentejo region of Portugal ([Fig. 48.2](#); [Hoskin 2001](#), [ch. 6](#)). These tombs, which are thought to date to the third millennium BC, have a tall backstone set vertically in the ground, and this is a true orthostat. Either side of the backstone is another stone of similar dimensions, but this is not an orthostat; instead, it leans on the backstone. Next to each of these sidestones is another similar leaning stone, and next to that yet another. In this way the chamber is octagonal and formed of seven stones, with an entrance and passage that face the backstone. The seven stones are large and sometimes enormous (the backstone of Anta Grande de Zambujeiro is no less than 5m in height), and the exceptional form of construction makes these tombs readily identifiable, and prominent in the landscape. The region in which they are found extends from the Atlantic across Portugal and into neighbouring Spain, perhaps 200km from east to west and a similar distance from north to south—an area so vast that any custom of orientation must surely be based on the sky.

And the custom of orientation is absolute: every single one of the 177 graves the writer has measured faced within the range of sunrise (and therefore that of moonrise also). That this should happen by chance is of course inconceivable, for the range of sunrise occupies only one-sixth of the horizon. Now suppose the builders thought it necessary to guarantee that their grave would indeed face sunrise (on two days each year). The simplest way to ensure this would be to align the grave to sunrise on the day building started—as we know happened with the alignments of Christian churches. But the graves are often enormous and these would have required months to construct, and the cultivation of food, on which the survival of the constructors depended, must have taken priority; so it is likely that the

Neolithic people of the Alentejo would have felt free to turn to building these graves only when the harvest was safely in. Therefore, *if* the graves were intended to face sunrise from time to time, and *if* this was achieved by aligning the tomb to sunrise on the day building started, then we would expect to find that most tombs faced sunrise in the autumn and early winter (but not in late spring and summer, the height of the agricultural season). And this is exactly what we do find (Fig. 48.3). This strongly suggests that these graves were indeed built to face sunrise, and some archaeologists see them as the most persuasive example in western Europe of a sunrise custom of orientation, and therefore of a role of astronomy in the *cosmovisión* of the builders.



FIG. 48.2. One of the seven-stone passage graves typical of the Portuguese Alentejo: Anta de la Marquesa, which is just across the frontier into Spain, near Valencia de Alcántara. The stone centre right is the backstone which is, or rather was, a true orthostat. The stone centre left leans on this, and further left we see the next two sidestones, each of which leans on its predecessor.

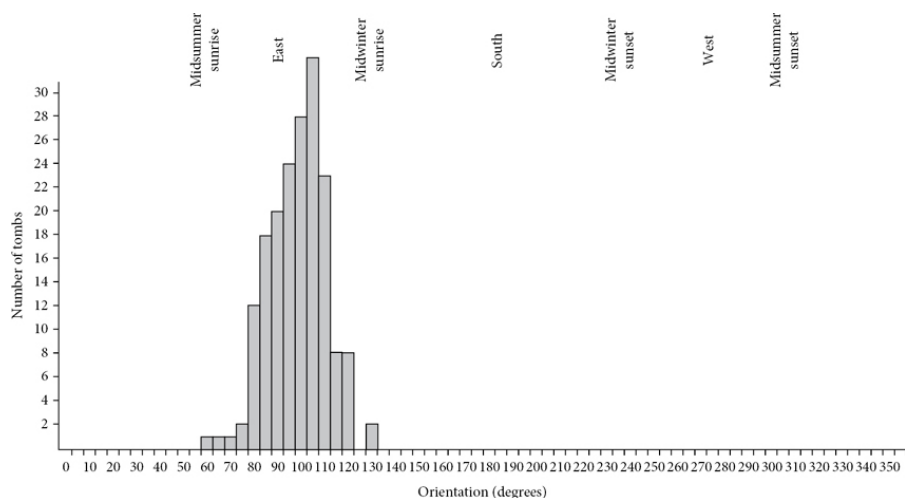


FIG. 48.3. Histogram showing the orientations of 177 seven-stone passage graves of the Alentejo. All the graves without exception faced sunrise at some time of the year, the majority in the late summer and autumn. Two appear from the histogram to have faced a little south of midwinter sunrise, but this is not so, as they look towards a steep cliff.

We have mentioned the passage graves of western Europe whose orientations are ambiguous, but these are atypical and few in number, and we shall disregard them in what follows. Most passage graves have a well-defined orientation. The majority are megalithic, built of a small number of large stones, but some are of tholos ('false-cupola') construction and made of a large number of small stones. Many of the megalithic graves are modest in size, but others are gigantic and almost defy belief, their construction involving a workforce numbering in the hundreds. By contrast, the tholos tombs with their small stones could have been built by a team of limited size.

In making his specific contribution to the study of passage graves, the archaeoastronomer abstracts from the form of the construction before him, and focuses his attention on measuring the grave's orientation. Going from one grave to the next, he compiles tables of azimuths (angles measured clockwise from true north), angular horizon altitudes, and latitudes. With these terrestrial data he can readily calculate the 'declinations' (celestial latitudes) of the heavenly bodies whose rising or setting the graves faced. And we find that there is much to be learned from this.

Except along the French Mediterranean coast and parts of Catalunya (to which we shall come shortly), the graves of western Europe, from the Channel Islands to Gibraltar, overwhelmingly faced the eastern horizon, and south of midsummer sunrise. Almost none faced northerly, and (with the exceptions just mentioned) almost none faced

westerly. Nearly all faced directions in which the sun rose at some time of the year, or faced further south, in directions where the sun had risen and was climbing in the sky or was around culmination. I characterize the former as ‘SR’ (sunrise oriented) and the latter as ‘SC’ (sunclimbing oriented). The seven-stone tombs of the Alentejo are without exception SR. The megalithic sepulchres of Montefrío, to the west of Granada, and the tholos tombs of Los Millares in Almería, both of the early third millennium BC, are—despite their very different constructions—also SR (Fig. 48.4; Hoskin 2001, 59–62, 66). Within each of these two groups there are a tiny number of tombs with exceptional orientations—at Los Millares, for example, in the very midst of all the SR tombs, and of identical construction, there are two that face south-west, a bizarre anomaly that is obvious to any visitor to the site—but the overall pattern is beyond dispute.

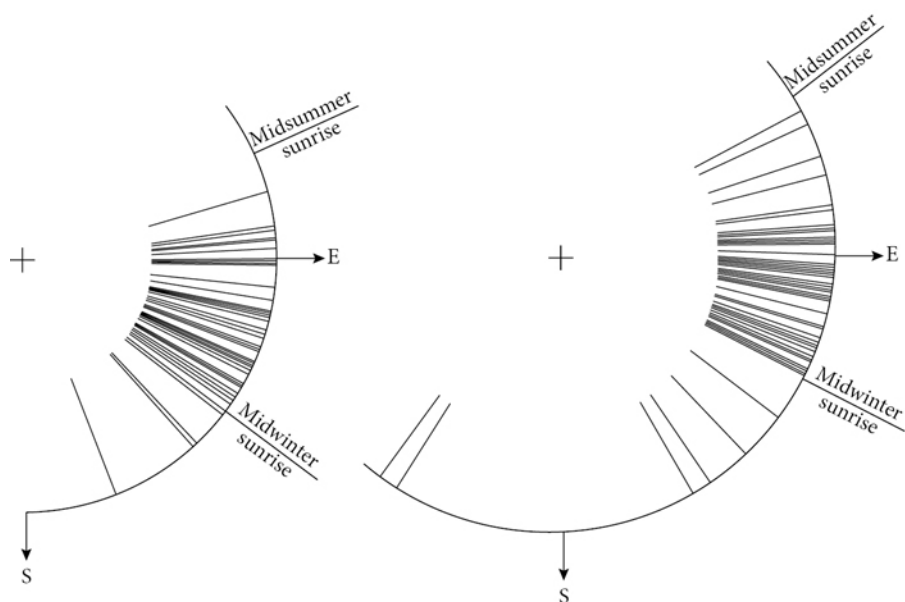


FIG. 48.4. (left) The orientations of 41 megalithic sepulchres at Montefrío, some 40km west-north-west of the city of Granada. (right) The orientations of 48 tholos and related passage graves at Los Millares, 100km from Granada in the opposite direction. In structure the two sets of graves could hardly be more different, but when we abstract from this and measure their orientations, we find that the two patterns are almost identical.

Montefrío and Los Millares are but two sites among many, and it is in the west of Iberia that a strict SR custom prevails—so much so that there it is almost unknown for a grave *not* to face sunrise. Of the 334 tombs I have measured (including those of the Alentejo), no fewer than 324—an astonishing 97.0%—are SR. But as we move further

from the Atlantic coast of Portugal increasing numbers of sites have tombs whose orientations are a mixture of SR and SC, and it is tempting to see the latter as a relaxation of the strict SR custom. Orientations that are neither SR nor SC are very unusual: of the 945 graves I have measured in Iberia and the adjacent Pyrenees, no fewer than 911 (96.4%) are SR or SC. Similar patterns are to be found in western France, on the French *causses*, and in the Channel Islands.

PASSAGE GRAVES THAT FACE WESTERLY

The major exception to this simple schema is a group of tombs near to the French Mediterranean coast. At Fontvieille, near Arles and close to the Rhône, are communal tombs that, instead of being on the surface, are quarried out of the bedrock (discreet access being provided by steps) and covered with slabs at ground level. These slabs are carefully shaped on the interior, as are the sides and base of the elongated rectangular chamber, but on the exterior the slabs are left in their natural state. As a result, the visitor may be standing on top of one of these tombs and be quite unaware of this; this is quite different from what we encounter with many megalithic graves, which seem to be intentionally prominent in the landscape, no doubt warning others that ‘we have been in this land since time immemorial’. Still more remarkably, instead of facing easterly, the Fontvieille tombs faced westerly, within the range of sunset (and moonset) ([Sauzade 2000](#); [Hoskin 2001](#), 140–147).

At one place at Fontvieille, Dolmen de Coutignargues, the builders found themselves excavating rock of such poor quality that they were unable to shape the sides of the chamber as they would wish. They therefore cut out of the bedrock a sizeable trench, and within this trench they constructed a passage grave with an elongated rectangular chamber whose sides were of drystone. The orientation of the grave is again westerly.

To the east of Fontvieille, throughout Provence and towards the Italian frontier, we find passage graves (presumably later) that seem to imitate the salient features of this Fontvieille exemplar, although these graves are not subterranean but on the surface. Like Dolmen de Coutignargues, they have rectangular (if less elongated) chambers, and they have drystone walls, although these are often interspersed with orthostats. Their orientations are invariably westerly, but whilst many face sunset, others face the sun when it was descending to the horizon. The latter’s ‘relaxation’ of the strict sunset custom seems to mirror the SC relaxation of the SR custom that we apparently find in Iberia and elsewhere.

Provence completely lacks the strictly megalithic (and easterly facing) passage graves that are so numerous in Iberia and western France, and this seems to be why the Fontvieille custom of facing westerly spread there without challenge. Similarly, in the Balearic Islands (where influence from southern France has long been recognized) the handful of Neolithic passage graves are all westerly facing. But on the mainland to the west of Fontvieille (and even across the Pyrenees into Catalunya) the situation is altogether more confused. Fontvieille-type graves share the territory with megalithic passage graves, the former facing westerly and the latter easterly. Interestingly, the co-existence of these opposing customs is particularly evident in Ardèche and Gard, not far from Fontvieille, and there it seems as though the clash was reduced by the orientations of tombs of each type being directed further towards south than is normal elsewhere (Hoskin 2001, [ch. 9](#) (Fontvieille, Provence and eastern Languedoc), [ch. 10](#) (western Languedoc and the eastern Pyrenees), and [ch. 11](#) (the Balearics)).

THE EMERGING PICTURE IN WESTERN EUROPE

That 97% of the passage graves of western Iberia faced within the narrow range of sunrise (and moonrise) is astonishing. Over this vast area, Neolithic builders intending to construct a passage grave *must* have involved the sky in their choice of orientation, for there is no other way in which the custom could have been articulated across a region extending from the Algarve in the south of Portugal to Galicia far away in north-west Spain. The individual orientations are facts that any sceptical enquirer can check. That almost all the orientations are directed to such a narrow range of the eastern horizon is likewise a fact, and over such a vast region, only the sky offered a means to ensure uniformity of orientation. We therefore know for sure that in western Iberia, the builders of passage graves oriented these monuments, their most significant constructions, with reference to the sky.

When we ask ourselves what it was in the sky that was so portentous to the Neolithic builders, we are on less certain ground. As we have seen, the planets are too complex in their motions to have left persuasive clues in the archaeological record, and in any case they seem implausible. The stars are so numerous, and their rising/setting points so changeable over the centuries, that some star can be proposed as the ‘target’ of almost any orientation for some supposed date of construction, and this is methodologically unsatisfactory. In any case, surely only the very brightest stars—or perhaps an unusual

asterism such as the Pleiades—are plausible targets, and these cannot account for the Iberian orientations.

We are left, therefore, with the sun and the moon, and in choosing between them as the target for the orientations that we find in western Europe, the archaeoastronomer has the problem that a tomb that sometimes faced sunrise (or sunset) necessarily sometimes faced moonrise (or moonset).

As already mentioned, the present writer favours the very simple hypothesis that west Iberian graves were oriented on sunrise when building began, and this would result in the pattern of orientations (to sunrise in the autumn and early winter) that we in fact encounter, the spring being an implausible time to begin construction of sometimes massive graves. But other archaeoastronomers believe that the data are consistent with orientations to the moon at certain phases and at certain times of year. It may be that analysis of the writer's own data will result in a refutation of his sunrise/sunclimbing model.

THE WAY AHEAD

Fieldwork—the location, and measurement, of monuments whose builders chose to orientate them in a particular direction—provides the raw data that the archaeoastronomer needs. In 2001 the present writer published a *corpus mensurarum* of some 3,000 grave orientations, from western Europe, the islands of the Mediterranean, and north Africa ([Hoskin 2001](#)), and he subsequently extended the area that has been investigated to north-western France and the Channel Islands ([Hoskin 2008](#)).

There are large numbers of such graves elsewhere, for example in Ireland, Holland, Germany, and Scandinavia. Investigators working in these regions are steadily adding to the European *corpus mensurarum*, and it will soon be possible to see if the patterns noted above have a wider applicability, or if the passage grave phenomena were more variable. But passage graves are not the only monuments with orientations. Investigators have already studied taula sanctuaries on Menorca, temples on Malta, nuraghe towers on Sardinia, rectangular talayots on Mallorca, and not least henges, recumbent stone circles and the like in Britain. Some of these monuments have well-defined orientations. In others the orientation is more vague and the data therefore more difficult to analyse with confidence; but as the analysis of grave orientations matures, so the methods can be applied with increasing confidence to the less certain data.

The fundamental fact to emerge from all this fieldwork is that patterns of orientation were indeed observed by builders over areas

far too extensive for the custom to have been articulated by reference to localized terrestrial ‘targets’ such as a sacred mountain or a mythical homeland. The customs can have been articulated only with reference to the sky, which therefore played a significant role in the *cosmovisión* of the Neolithic peoples of Europe.

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Death, Bodies, and Persons

CHAPTER 49

MORTUARY PRACTICES, BODIES, AND PERSONS IN THE NEOLITHIC AND EARLY-MIDDLE COPPER AGE OF SOUTH-EAST EUROPE

DUŠAN BORIC

INTRODUCTION

SOMETIME during the first half of the fifth millennium BC, on the plains of south-east Transdanubia, near the western banks of the Danube, a group of relatives buried an adult male member of their lineage within their settlement. Maintained over several generations through successive interments, the burial site reminded everyone of the prominent standing of the lineage, carrying forward the fame of a successful genealogy. As was common when burying men, a shaft-hole stone axe and an adze were placed on the right shoulder of the deceased, laid to rest crouched on his left side and facing south. Six pots were placed around the body to sustain the man's journey to the afterworld. The burial was covered by soil and a wooden pole was placed to mark the location of the head. Several years after the burial, relatives remembering the enduring legacy of this individual went back to the grave to retrieve the man's skull, as had become the norm here and in some surrounding villages for particularly honoured members. The surviving power and potency of the skull would help the lineage keep alive the dead relative's many deeds, enhancing the fame of the lineage for generations to come. Yet digging for the skull, and potentially facing bare bones with patches of still decomposing flesh, was a difficult and life-changing experience for some. After the skull was lifted and cleaned, they put a lower jaw of a wild boar in its place and backfilled the small pit.

This reconstruction relates to burial 92 from the late Neolithic Lengyel culture settlement of Zengővárkony, Hungary (Dombay 1960, 78–79, Tab. 36/13; Zoffmann 1969–70, 65). It evokes many of the elements and themes characteristic of the negotiation of group and

personal identities during Neolithic and Eneolithic burial practice in south-east Europe: the choice of place for interment, the treatment of the dead body, its adornment and the provision of offerings, bodily fragmentation, the circulation of disarticulated body parts (especially the skull), and combining human bodies with the body parts of certain animals (preferentially animals' teeth, skulls, and mandibles).

THEORIES, SOURCES, AND COVERAGE

As elsewhere, analyses of Neolithic and Eneolithic (i.e. Copper Age) mortuary practices in south-east Europe were influenced by specific theoretical traditions and their preferred topics. With some notable exceptions, mortuary data were rather under-theorized in culture history approaches, which used grave assemblages for typological comparative analyses and for synchronizing neighbouring culture groups. Processual archaeology (e.g. [Chapman 1983](#)) tended to focus on social inequality (cf. [O'Shea 1996](#)), a topic that remains influential in spite of post-processual critique (e.g. [Borić 1996](#); [Raczky and Anders 2006](#); [Siklósi 2004, 2010](#); [Zalai-Gaál 1986](#)), especially given the richly furnished graves at the Varna I cemetery in Bulgaria (e.g. [Bailey 2000](#); [Chapman 1991](#); [Renfrew 1986](#); see below). Recently, analyses of gender and/or age categories (e.g. [Chapman 1997](#); [Sofaer Derevenski 1997, 2000](#)) or ancestors and personhood (e.g. [Chapman 1994](#); [Whittle 1998](#)) have also been undertaken.

The spectrum of different approaches can be exemplified by [Lichter \(2001\)](#) and [Chapman \(2000\)](#). Lichter's work is an impressive collection of systematized and analysed data about Neolithic to middle Copper Age burial practices across south-east Europe. Its detailed catalogue, exhaustive bibliography and lucid conclusions make this volume a key reference book, but in true German tradition Lichter avoids any 'excessive' speculations about the patterns identified and remains pessimistic regarding the interpretive potential of archaeological data (e.g. [Lichter 2001, 387](#)). In contrast, [Chapman's \(2000\)](#) publication focuses on only three Hungarian sites, but sets itself the ambitious theoretical goal to break free from the dichotomy between structure and agency. By taking burial rows as units of analyses, he attempts to follow the dynamics of mortuary 'micro-traditions'. In spite of their differences, these approaches are complementary. Lichter's detailed data analysis is indispensable for gaining spatial and temporal depth, yet lacks attention to 'tensions' and dynamics, giving a static view of the mortuary data. Chapman's analysis outlines how certain practices develop and become a norm through acting agents, but neglects the larger temporal and spatial

scales.

This chapter reviews the evidence of Neolithic and early-middle Copper Age burial practices across south-east Europe. Much of the data obtained in the past half a century or so is still awaiting detailed publication, with the number of known burials varying regionally and chronologically. Whilst this may genuinely represent the prevalence of burial (as opposed to cremation, exposure, or cannibalism, to mention a few alternatives), it may also highlight regionally varied research strategies, such as the effort invested in finding cemeteries, which are less visible than for instance tells, or the size of excavations. Recently, some of the largest cemeteries in the region have been discovered in advance of large motorway projects (e.g. Alsónyék-Kanizsa-dűlő in south-west Hungary, which has yielded nearly 2,500 burials within a Lengyel culture settlement, see [Zalai-Gaál 2009](#)). For the sake of simplicity, south-east Europe is separated into the eastern Balkans, the Carpathian Basin with the western Balkans, and the southern Balkans (Greece and Macedonia) ([Fig. 49.1](#)). In line with other evidence, mortuary practices can be chronologically divided into early to middle Neolithic (c. 6300–5400 BC), late Neolithic (c. 5400–4500 BC), and early to middle Copper Age (c. 4500–3500 BC).¹

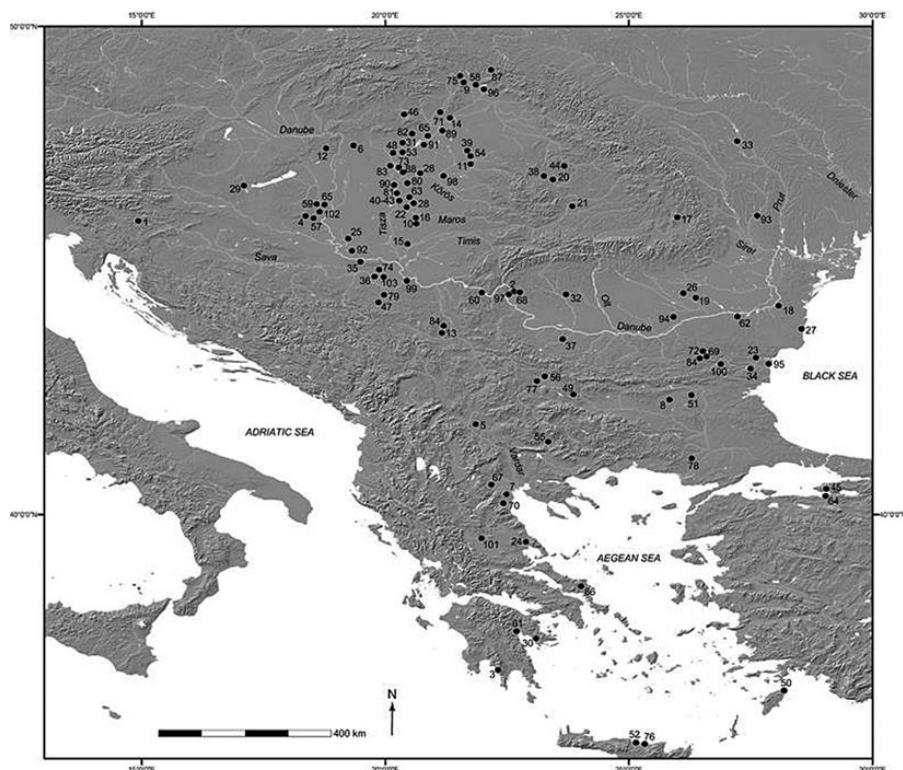


FIG. 49.1. Map showing Neolithic and Copper Age sites in south-east Europe mentioned in the text.

1. Ajdovska Jama; 2. Ajmana; 3. Alepotrypa; 4. Alsónyék-Kanizsa-dűlő; 5. Anzabegovo; 6. Aszód-Papi földek; 7. Avgi; 8. Azmak; 9. Barca; 10. Beşenova Veche; 11. Berettyóújfalu-Herpály; 12. Bicske-Galagonyás; 13. Blagotin; 14. Bodrogkeresztúr-Kutyasor; 15. Botoş; 16. Cenad; 17. Cernatul de Jos; 18. Cernavodă; 19. Cernica; 20. Cluj; 21. Decea Mureşului; 22. Deszk-Olajkút; 23. Devnja; 24. Dimini; 25. Donja Branjevina; 26. Dudeşti; 27. Durankulak; 28. Endrőd-Öregszőlők; 29. Esztergályhorváti; 30. Franchthi; 31. Füzesabony-Gubakút; 32. Gârleşti; 33. Glăvanesti Vechi; 34. Goljamo Delčevo; 35. Golokut; 36. Gomolava; 37. Gradešnica; 38. Gura Baciului; 39. Hajdúszoboszló; 40. Hódmezővásárhely-Bodzáspart; 41. Hódmezővásárhely-Gorzsa II; 42. Hódmezővásárhely-Kökénydomb; 43. Hódmezővásárhely-Kopáncs; 44. Iclod A and B; 45. Ilipinar; 46. Istállós-kő Cave; 47. Jaričište; 48. Jászladány; 49. Junacite; 50. Kalythies Cave; 51. Karanovo; 52. Kephala; 53. Kisköre-Gát; 54. Konyár-Ziegelei; 55. Kovačevo; 56. Kremikovci; 57. Lánycsók; 58. Lažňany; 59. Lengyel; 60. Lepenski Vir; 61. Lerna; 62. Malák Preslavec; 63. Maroslele-Pana; 64. Menteş; 65. Mezőkövesd-Mocsolyás; 66. Mórág-Tűzkődomb; 67. Nea Nikomedeia; 68. Ostrovul Corbului; 69. Ovčarovo; 70. Paliambela-Kolindros; 71. Polgár-Csőszhalom; 72. Poljanica; 73. Rákóczi-falva-Bagi-föld; 74. Šašinci; 75. Šebastovce; 76. Skotino Cave; 77. Slatina; 78. Soufli; 79. Stubline; 80. Szarvas-Szappanos; 81. Szegvár-Tűzköves; 82. Szihalom-Pamlényi-tábla; 83. Szolnok-Szanda; 84. Targovište; 85. Tečić; 86. Tharrounia; 87. Tibava; 88. Tiszaföldvár; 89. Tiszapolgár-Basatanya; 90. Tiszaug; 91. Tiszavalk-Kenderföld; 92. Topole-Bač; 93. Trestiana; 94. Valea Orbului; 95. Varna I; 96. Veľké Raškovec; 97. Veleznica; 98. Vésztő-Mágor; 99. Vinča; 100. Vinica; 101. Zarkou; 102. Zengővárkony; 103. Zlatara.

EARLY TO MIDDLE NEOLITHIC (C. 6300–5400 BC)

Throughout the entire study area, burials of this period remain infrequent. It is rare to find more than one or two per settlement (the highest number attested is 23),² and many sites have none. This can only partly be explained by limited excavation. Rather, it seems only a small portion of the population was buried within the settlement, there being other ways of disposing of the dead. If so, how were individuals selected for intramural interments and what alternative ways of disposal might there have been? Whilst answers to these questions must remain speculative, patterns in the data offer glimpses of social structure and belief systems.

There are many similarities between the burial practices of the eastern Balkans (Karanovo I–II, Kremikovci, Dudeşti and Ovčarovo culture groups), those in the western Balkans and the Carpathian Basin (Starčevo-Körös-Criş complex), and the southern Balkans (Protosesklo and Sesklo pottery complexes in Greece, and Porodin and Anzabegovo regional pottery styles in Macedonia):

- a) only intramural burials are known;³
- b) burials were usually placed under building floors—mainly in the southern and eastern Balkans, e.g. Karanovo (Bačvarov 2003), Lepenski Vir (Stefanović and Borić 2008), Soufli (Gallis 1982), Szolnok-Szanda (Kalicz and Raczky 1982) and Trestiana (Comşa 1995a), in settlement pits mixed with other cultural material—mainly in the western and northern Balkans, e.g. Blagotin, Donja Branjevina (Karmanski 2005), Endrőd-Öregszőlők 119 (Makkay 2007), Gura Baciului (Lazarovici and Maxim 1995), Zlatara (Leković 1985), etc—or in occupation levels of settlements. In several instances burials of neonates were placed in pots, e.g. Anzabegovo (Gimbutas 1976, 397), Azmak (Bačvarov 2003).
- c) there are no special grave constructions, although at Lepenski Vir a number of burials are covered or encircled by stone blocks, or found next to large rocks (Stefanović and Borić in press);
- d) single burials dominate, but occasional double burials exist—e.g., Deszk-Olajkút (Trogmayer 1969, 7), Glăvanesti Vechi (Comşa 1995a, 246). Multiple burials are also found at several sites in the Danube Gorges—Ajmana (Stalio 1992), Lepenski Vir, and Velesnica (Vasić 2008), and elsewhere—e.g. Hódmezővásárhely-Kopáncs II, Szarvas-Szapannos (Trogmayer 1969, 5–7), Nea Nikomedeia (Rodden 1962, 1965);
- e) where two or more individuals were found together, children frequently accompany adults (e.g. Ajmana, Jaričište, Lánycsók; Kalicz 1990).
- f) almost all burials are flexed inhumations placed on their right or left sides.⁴ This varies between regions: for example, in the Körös group more burials were found on their left side (e.g. Trogmayer 1969). There is no differentiation on the basis of age or sex. The exception are extended burials from the Danube Gorges region (see below) and four others from elsewhere. In addition, two ‘burials’ with burned bones have been found and in several instances disarticulated secondary skull burials are attested, as well as burials without skulls;
- g) there is no obvious preference in orientation, although slightly more burials are oriented with the head toward the east, especially among the Körös group in the Carpathian Basin (cf. Lichter 2001, 175);
- h) there are slightly more adult or mature women than men, and more than a quarter of burials are subadults (Lichter 2001, fig. 10, 170);
- i) burial offerings are rare, and may consist of 1–2 vessels, usually placed near the head—e.g. Cernatul de Jos, Cluj (Comşa 1974, 116), Franchthi (Jacobsen and Cullen 1981), Tečić (Galović 1967), bone awls (e.g. Lepenski Vir), flint (e.g. Cenad (Comşa 1974, 115), items of personal adornment (e.g. beads, pendants, and armbands: Franchthi, Gradešnica, Slatina (Bačvarov 2003) and in one case, at Golokut, the remains of animal skulls (Fig. 49.2a) (Borić 1999). Pottery fragments sometimes cover the burial (e.g. Gura Baciului, Lepenski Vir, Šašinci);
- j) occasionally, red or yellow ochre was found, frequently near the skull (e.g. Bešenova Veche; Comşa 1974, 114);
- k) certain burials, especially of children, might have been wrapped prior to burial (e.g. Kovačevo; Lichardus-Itten et al. 2002, 116, Pl. 9/2, Lepenski Vir; Borić and Stefanović 2004).

I) fragmented human bones are frequent ‘stray’ finds in settlement deposits.

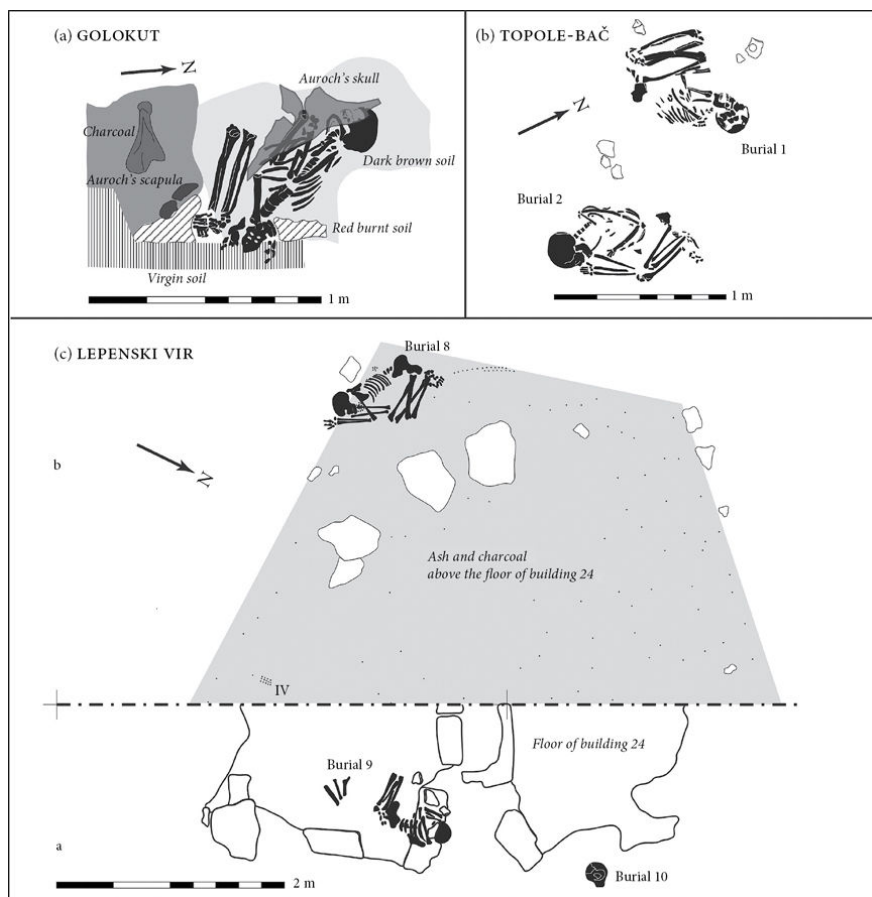


FIG. 49.2. (a) Crouched burial with aurochs skull, pit-dwelling 7, Golokut, Serbia (after Borić 1999, fig. 28); (b) burials from Topole-Bač (after Trajković 1988); (c) burials 8 and 9 (phase III) placed above the floor of building 24 (phase I–II), Lepenski Vir (after Stefanović and Borić in press).

Differences between early and middle Neolithic burial practices across the study area are most clearly visible in the coterminous existence of mortuary practices firmly grounded in Mesolithic forager traditions in the Danube Gorges in the period 6300–5900 BC (e.g. Bonsall et al. 2008; Borić 1999, 2011; Borić and Dimitrijević 2007, 2009). Lepenski Vir, the key site of this regional group, boasted trapezoidal buildings, sculpted boulder artworks, and a number of burials (e.g. Borić 2005; Radovanović 1996). In spite of contacts with established Neolithic communities, at Lepenski Vir, Vlasac, Padina, and Hajdučka Vodenica, burial practices follow the late Mesolithic tradition of supine burial parallel to the River Danube, the head pointing downstream (e.g. Borić 2005; Borić et al. 2009; Radovanović

1997). Yet, despite this conservatism, some new features were introduced during the Mesolithic–Neolithic transition phase at Lepenski Vir. Most strikingly, 40 neonate burials were placed into small pits in the back of 17 of the trapezoidal buildings, under the floor level. The connection of child burials with buildings recalls the rites of early Neolithic communities in the Balkans and Anatolia, and might have been introduced to the Danube Gorges through contacts with them (Borić and Stefanović 2004; Stefanović and Borić 2008). After 5900 BC, with the start of a ‘consolidated’ (middle) Neolithic, most trapezoidal buildings were abandoned and domestic animals introduced to Lepenski Vir. Crouched burials now dominate, several of which were of first-generation migrants (Borić and Price 2013). The ultimate origin of this tradition was probably the Near East (cf. Borić and Miracle forthcoming).

Although the lack of clear rules regarding burial position and orientation could suggest small and fragmented social groupings (cf. Chapman 1983, 2000a, 37), certain sites exhibit a shared practice of structured deposition. For instance, burials 8 and 9 at Lepenski Vir were placed 2.5m apart on their right sides, but with diametrically opposed orientations and facing each other (Fig. 49.2c; Srejović 1972), a pattern replicated on a larger scale at Ajmana (Stalio 1992). At Topole-Bač in the Carpathian Basin, two burials were placed next to each other on their right sides with diametrically opposite orientations and their backs turned on each other (Fig. 49.2b; Trajković 1988, 99). These examples indicate the importance of symmetry and polar opposites, perhaps connected with prescribed ritual and/or religious observances and relationality between two individuals.

Whilst certain sites see repeated interments over time, many others, especially in the northern Balkans, yielded only one or two individual burials. Coupled with the rather ephemeral settlement traces and the destruction of above-ground buildings, this could indicate that site abandonment might have related to taboos surrounding death (cf. Borić 2008; Chapman 1994). The general scarcity of grave goods may indicate that the mortuary domain did not play an important part in signalling wealth, gender or age differences, in contrast to both earlier and later periods. Yet the occasional beads and pendants from clay, bone, marble, *Spondylus* shell, or nephrite in settlement deposits suggest that such ornaments primarily pertained to the living and not the dead. Personhood and identity might also have been expressed through variations in hairstyles, frequently shown on contemporary figurines (e.g. Tomaž, forthcoming). These are most often found as broken objects in settlement pits, alongside sherds, human and animal bones, and daub. One dominant type, the so-called rod-like figurines,

consist of elongated necks continuing into a head with carefully depicted hair and frequently coffee-bean eyes. The legs and buttocks are exaggerated, with the female pubic triangle explicitly depicted, yet these figures could simultaneously resemble the male sex if turned in a particular way (Bailey 2005; Hansen 2007). The existence of such sexually explicit and ambiguous imagery, coupled with the emphasis on child burials, suggests that reproduction was of paramount importance.

Since only a fraction of the living population was being buried in settlements, there are doubts about what could be considered a mortuary norm and exception (cf. Boyadžiev 2009; Perlès 2001, 274). Nevertheless, the known rites provide information on religious, ritual, and social aspects. Mesolithic burial practices in the region were largely discontinued, but although early Neolithic mortuary rules created a pool of selected norms that then shaped late Neolithic practices, this period also met a resurgence of surprisingly old ways of dealing with the dead.

LATE NEOLITHIC (C. 5400–4500 BC)

In the southern and eastern Balkans, some of the old tell sites were continuously occupied and new settlements established (cf. Link 2006). Many new tell sites emerged, especially along the big rivers of the Carpathian Basin. There is significant change in pottery (and clay figurines), and copper metallurgy enabled the more prolific production of ornaments and tools in certain areas of the central and eastern Balkans (cf. Chapman 2006; Borić 2009). The diversity of mortuary elements now being introduced, along with the appearance of much more rule-bound behaviour, matches these dynamic developments. It is possible to divide the region into the eastern Balkans, with their large extramural cemeteries; the cultures of the Carpathian Basin and western Balkans, dominated by settlement burials; and Greece, where cremations and disarticulated human bones in caves and settlements are known.

The eastern Balkans

Large extramural cemeteries occur within the Dudești-Boian culture of Muntenia (e.g. Cernica with 370 burials, Valea Orbului with 102 burials) and the Hamangia culture of Dobrudža (e.g. Durankulak with 520 burials, Cernavodă with 556 burials). The cemeteries of the north-east Bulgarian Poljanica culture are smaller, with only twenty-five graves from Poljanica itself (Todorova 1982). Burials across the region

are mostly flexed, oriented east–west, and accompanied by various ornaments, tools, and vessels, generally placed around the upper body.⁵ The Boian culture site of Cernica stands out, since about 90 per cent of burials were supine inhumations, mostly oriented west–east. Some contained perforated red deer canines alongside more usual grave good categories (Cantacuzino 1969; Comşa and Cantacuzino 2001).

The most famous cemetery is probably Durankulak (Todorova 2002). Durankulak covers the period from (at least) the late Neolithic Hamangia culture (phases I–IV, c. 5000–4500 BC) through the early–middle Copper Age Varna culture, but its dating relies mostly on pottery typology, with only three radiocarbon dates available. Durankulak is characterized by simple individual burial pits. In later phases, some are covered with stone slabs, and cenotaphs (symbolic burials with grave offerings but without human remains) also appear. Ochre was occasionally strewn on bodies and some showed staining suggestive of a textile covering. Grave goods were diverse, comprising up to seven vessels per burial, mostly around the head or over the body, as well as stone and antler axes and adzes. *Spondylus* and copper were used to create arm-rings and beads, but the latter were also fashioned in malachite or gold. Wild and domestic animal skulls (wild ass, red deer, sheep) and perforated red deer canines were found with supine inhumations at Durankulak, whilst some Cernavodă burials contained pig skulls.

Hence, in Muntenia, north-east Bulgaria, and Dobrudža, two different burial traditions exist, which do not necessarily coincide with culture groups as defined by pottery styles. The first is characterized by flexed inhumations, mostly on their left sides and oriented east–west (e.g. most of the Boian culture and Poljanica culture cemeteries). The second tradition sees some flexed burials, especially of women, but most are supine inhumations in a dominant orientation (west–east Cernica, north–south in Hamangia phases at Durankulak). These elements, and the presence of grave goods such as red deer canines, antler axes, or (wild) animal skulls at Durankulak and Cernica (see also Todorova 2002, 46–47), may suggest that regardless of the adoption of Neolithic materialities and practices (e.g. pottery, domesticates), communities might have adhered to much older Mesolithic rites. Moreover, some of the new culture groups in the Dobrudža, Muntenia, and Black Sea coastal regions have no early–middle Neolithic antecedents. The distribution of supine late Neolithic burials may even avoid areas with known early Neolithic sites (Fig. 49.5; cf. Lichter 2001, 151–153). These instances suggest a degree of hybridization in the middle–late Neolithic, but also strong differences in the belief systems and possibly origin myths of particular

communities: one aligning itself with Neolithic descent from the east, the other with Mesolithic descent from the north and west. The use of a particular pottery style was hence not an *exclusive* medium for underlining identity or belonging. This pattern is also applicable in the Carpathian Basin. These large-scale regional trends underline the endurance of past cultural elements, as well as the flexibility of mythological, ritual, religious, and ideological constructs. The communities of this emerging late Neolithic world, regardless of their origins, were assembling elements from diverse cultural repertoires.

The Carpathian Basin and the western Balkans

In the second half of the sixth millennium BC, Neolithic farming groups in the upper Tisza region are known as Alföld Linear Pottery culture (Hungarian AVK, with its substyles Tiszadob, Bükk, Szakálhát, and Esztár) and Szatmár groups. They expanded into territories with known Mesolithic occupations (cf. [Kertész 1996](#)). The Tisza-Herpály-Csőszhalom regional culture complex overlaps with the Linear Pottery (AVK) sites between c. 5350–4950 BC, and continues on until c. 4500 BC ([Yerkes et al. 2009](#), 1077; [Raczky 2009](#)). Sites of the Lengyel culture concentrate west of the Danube in Transdanubia (Hungary), but some are found as far north as Slovakia. The contemporaneous Vinča culture dominates the south-eastern Carpathian Basin and the central Balkans. Finally, two sites—Iclod A and B, with 40 and 50 burials respectively—are known from the Iclod culture group of Transylvania in the eastern Carpathians ([Lazarovici 1976, 1991](#)).

Burial practices throughout the region show certain parallels, although these are played out differently in detail. All are found on settlements. The flat sites of the AVK generally yield few burials close to houses or in settlement pits (e.g. Mezőkövesd-Mocsolyás ([Raczky et al. 1997](#), 28–33); Füzesabony-Gubakút ([Kalicz and Koós 1997](#))) whilst small groups occur on Tisza culture tells and flat sites.⁶ At the Polgár-Csőszhalom tell burials were mainly of children and adult men. The surrounding flat settlement yielded mostly adult females ([Raczky and Anders 2006, 2008](#); [Anders and Nagy 2007](#)). At the Berettyóújfalu-Herpály tell, three-quarters of the excavated burials were children underneath buildings, but a small group of graves was discovered 200m away from the tell ([Kalicz and Raczky 1984](#)). On Lengyel sites, aggregations tend to be larger (in one instance up to 80). In contrast, Vinča sites rarely have more than two burials, but a cemetery is known from Botoš ([Grbić 1934](#)), showing that more burial grounds may be revealed once more off-tell research is carried out.

Although most burials are single inhumations, there is great variation in practices. Double burials often involve children. The AVK

child from Konyár-Ziegelei was accompanied by a separate child skull (Kalicz and Makkay 1977, 138), whilst several Tisza culture sites have yielded double burials of two children, a child with an adult and, more rarely, two adults (e.g. Hódmezővásárhely-Gorzsa II; Hódmezővásárhely-Kökénydomb (Horváth 1992)). Variation can even occur within a single site. Thus, at the Lengyel site of Zengővárkony, the double burial of an adult and a child, children buried in vessels, and even cenotaphs were all uncovered. Several cremated burials have also been noted from the north of the Lengyel culture (e.g. Aszód-Papi földek; Zalai-Gaál 1984). At Bicske-Galagonyás in the northern Carpathian Basin, two different modes of burial co-existed: four inhumations were left flexed, and two extended (Makkay et al. 1996).

The secondary manipulation of the deceased is a common theme. One of the burials at Bicske-Galagonyás had their leg redeposited behind their head whilst the former was still connected (Makkay et al. 1996). The north Bükk site of Istállóskő Cave contained the disarticulated burned bones of around 25 mainly juvenile individuals (Korek and Patay 1958, 41). However, most instances involve the head. At Lengyel culture Zengővárkony, the skulls and/or mandibles were retrieved from the burials of certain individuals, mainly men and older women, whilst wild boar mandibles and more rarely dog remains were sometimes put in the place of or next to the human skulls (Zalai-Gaál 1994, 2009). The presence of boar tusk plates and boar mandibles, also mirrored in the contemporaneous Tisza culture (e.g. at Polgár-Csőszhalom), may indicate some special connection between males and wild boar, perhaps recalling the spirit of a strong wild animal as a desirable category for males. Skull removal and the frequent association of such partly exhumed male burials with wild boar mandibles and tusks may also express beliefs related to human-animal metamorphosis and/or special social exchanges. Similarly, red deer canines, or imitations in bone, were found at Polgár-Csőszhalom (cf. Siklósi 2010).

Grave goods in general comprise a common repertoire across the western Balkans, although different culture areas have particular preferences. Pottery is very frequent, with 19 vessels in one burial at the Lengyel culture site of Zengővárkony. In contrast, only five out of 102 graves at Polgár-Csőszhalom received vessels. Polished stone tools are usually a male grave good (e.g. Korek 1958), but at Zengővárkony several women were also buried with them. Much emphasis is placed on personal ornaments. Although these show regional peculiarities in their composition and relative frequency, there is a general tendency to employ diverse materials for beads, arm-rings, and girdles: *Spondylus* and *Dentalium* shells, copper, malachite, marble, bone, clay, limestone, or even alabaster (e.g. Anders and Nagy 2007, 84–86;

Chapman 1981). Ochre is also relatively frequent (e.g. Korek 1989, 23–43; Bakay 1969). In most regions, grave goods are preferentially deposited around the upper body.

Throughout the region, orientation and body position are powerful signals for identity. Left crouched inhumations in easterly orientations dominate throughout the AVK (e.g. Kalicz and Makkay 1977) and in the earliest LBK of the western Carpathian Basin (see Hofmann and Orschiedt, this volume). In the Tisza culture, there is a sex-related pattern, with more females crouched on their left and more males crouched on their right. However, the most important distinction is perhaps between crouched and extended supine burials. The latter dominate at Bodrogheresztúr-Kutyasor and Kisköre-Gát in the Upper Tisza region, at the northern Lengyel culture site of Svodín (Němejcová-Pavůková 1986, 1995), and in the Iclod culture (Lazarovici 1976, 1991). This pattern may confirm that older, Mesolithic burial traditions re-emerged during this period beyond the core area of the Neolithic distribution, as in the eastern Balkans. This is also supported by the importance of wild animals in many of these traditions. However, this is not necessarily an even process. For instance, in the Lengyel culture supine inhumations are more common in the north, whilst the south sees both left crouched burials oriented toward the east and north-east, and right crouched, west-oriented burials (e.g. Zalai-Gaál 1986, 1992). At the eponymous site of Lengyel (Wosinsky 1891) there is an eastern group with burials mostly placed on their left sides and a western group with burials generally on their right sides. This pattern of ‘polar opposites’, or conscious correspondence between a particular side and the orientation of the burial, recalls the contrasting spatial positioning of two or more burials in early and middle Neolithic contexts. Since these polarizations can exist between sites within a sub-region and even within a single site, they may be seen as ‘fractal’; that is, each smaller part of a larger unit repeats the divisions observed at the macro-regional level (cf. Strathern 2004). This might have had implications for how personhood and identity were conceptualized at this time.

Differences between regions are also evident in who is represented in the burial record. For example, in the AVK, all ages and both sexes appear equally represented, whilst between 25 and 30 individuals at the Protolengyel site of Esztergályhorváti were mostly juvenile males (Barna 1996). One individual had a head trauma, perhaps indicating that this burial contains victims of violence. Whilst this may be a special case, more systematic selection is evident elsewhere. The 31 burials at the Vinča culture site of Gomolava (Fig. 49.3) now directly dated to c. 4650–4550 BC, close to the end of the Vinča occupation at the site (Borić 1996, 2009; Brukner 1980), were probably all males

(cf. [Stefanović 2008](#)). It is unclear how and where the bodies of women were disposed of. In the Iclod culture group, most burials are male, and the small number of children may indicate selective decisions regarding the right for burial.

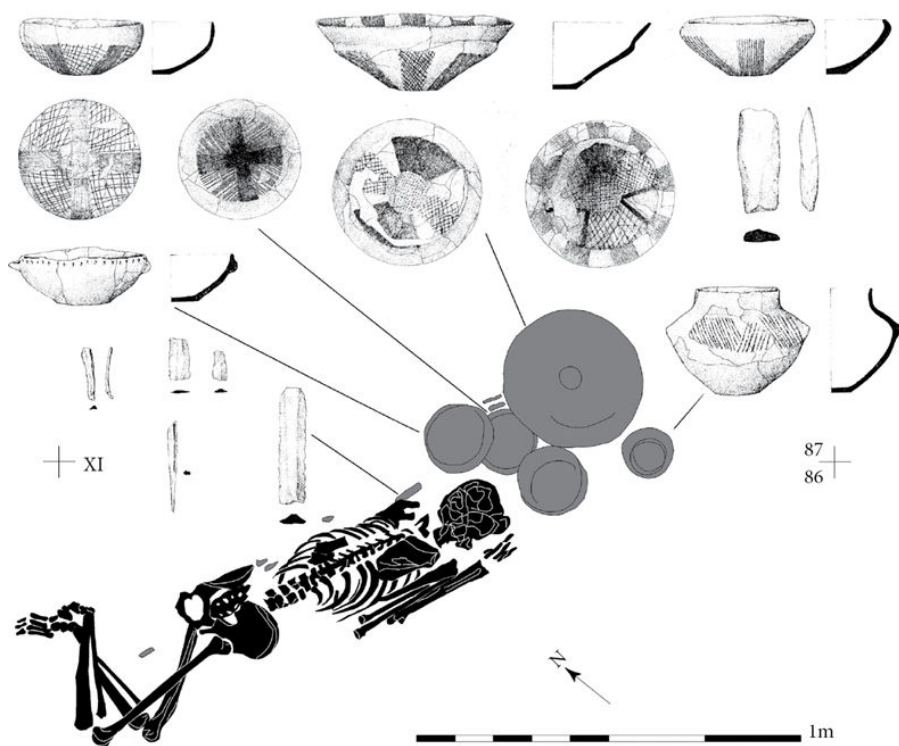


FIG. 49.3. Male Burial 2/1975, late Neolithic phase Ib, Gomolava, Serbia (adapted after [Brukner 1980](#), Tab. VII-VIII).

LATE NEOLITHIC (C. 5300–4500 BC) AND FINAL NEOLITHIC (C. 4500–3200 BC) IN THE SOUTHERN BALKANS

In late Neolithic Greece, there are few primary burials from sites such as the Dimini tell in northern Greece and the Lerna and Skoteni Caves in southern Greece ([Fowler 2004](#); Heurtly 1932). Cremation burials were found at Soufli, Plateia Magoula Zarkou ([Gallis 1983, 1996](#)), and Avgi ([Stratouli et al. 2010](#)), a tradition linking back to early Neolithic. At Zarkou, cremation burials formed a separate cemetery away from settlement. Existing differences between southern and northern Greece were further accentuated in the final Neolithic. At this time, cemeteries outside the settlements at Kephala and Tharrounia contain

clusters of stone-built graves, possibly reflecting kinship affiliations (Fowler 2004, 100). During this period burials were also found in front of Franchthi Cave. Disarticulated human bones occur as stray finds in many contexts, such as caves (e.g. Alepotrypa in the southern Peloponnese and Kalythies on Rhodos) and open-air sites (e.g. Makryalos in Macedonia) (see Triantaphyllou 2008). There is evidence for the secondary treatment of human remains and preferential reburial/deposition of particular body parts, with people frequently observing age and gender differences. It is unclear if these mortuary practices reflect particular types of social organization, or whether there is disjuncture between burial customs and other aspects of social life.

EARLY TO MIDDLE COPPER AGE⁷ (C. 4500–3500 BC)

The eastern Balkans

In the eastern Balkans, the period after 4500 BC, termed the Kodžadermen- Gumelnița-Karanovo VI (or KGK VI) culture complex, largely continues earlier trends. New tell settlements appear and various regional groups across south-east Europe came to share certain cultural elements. In the eastern Balkans in particular, there are stronger continuities with previous late Neolithic developments than in areas to the west. Extramural cemeteries continue, such as Durankulak and Varna I on the Black Sea coast, well known for its spectacular gold, copper, and *Spondylus* finds (Ivanov 2000). Some burials show traces of possible organic coverings (textile or hides) and wooden planks (coffins?); as at the contemporaneous Devnja cemetery (Todorova and Simeonova 1971). At Durankulak many burials were covered by stone slabs (e.g. Fig. 49.4b; Todorova 2002; Boyadžiev 2008), indicating the continuity of local mortuary rites. At both Varna I and Durankulak, lumps of ochre were found in several burials. One-third of burials (primarily male) at both these sites were found in extended supine positions, with a further 20–30 per cent in flexed positions on their right sides (primarily female). Most are oriented with their head to the north or north-east. There are also cenotaphs, and these are among the richest burials on site (Lichter 2001, 94). There is a correlation between the number of vessels and the age of individuals (e.g. child burials never have more than two vessels), but even in the richest burials, ceramics were poorly fired compared to those from settlements. As in the late Neolithic, tools (of copper, stone, flint, or red deer antler) were mainly found with male

individuals, particularly around the right shoulder (e.g. [Fig. 49.4a](#)), indicating a specific male embodiment shared by the contemporaneous communities of the region (see below).

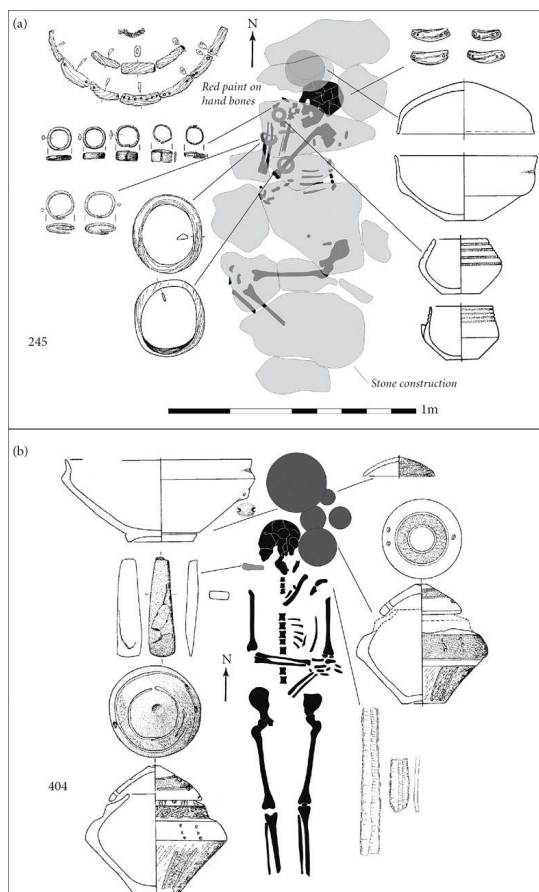


FIG. 49.4. Varna culture phase: (a) female Burial 245 and (b) male Burial 404 from Durankulak (adapted after [Todorova 2002](#), tab. 23 and 58).

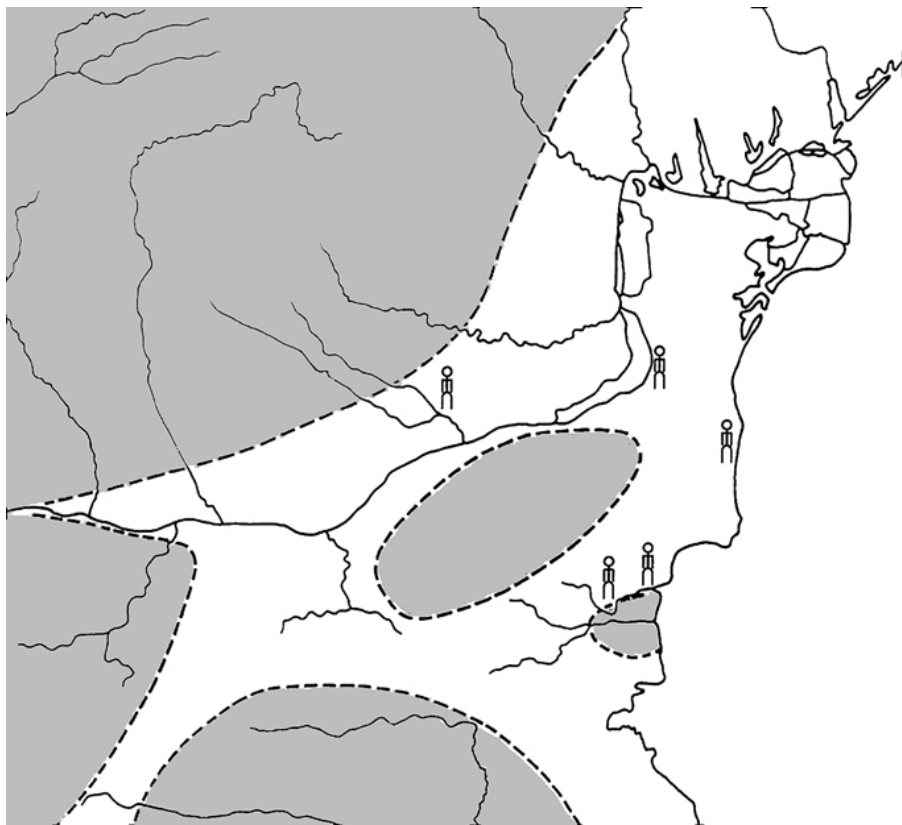


FIG. 49.5. Map showing areas with Neolithic and Copper Age cemeteries containing extended supine burials as possible indications of Mesolithic mortuary rites in Muntenia, north-east Bulgaria and Dobrudža; shaded areas indicate zones of primary Neolithization in these regions (adopted after [Lichter 2001](#), fig. 71).

More artefacts and exotic ornaments were found with the 294 inhumations at Varna I than at any other cemetery. The burials richest in copper and gold objects were extended supine burials, alongside a number of cenotaphs and disarticulated burials from the south-east of the cemetery.

The iconic Varna burial 43 received several copper axes and chisels, an antler pick/axe, and various golden appliquéés, possibly attached to clothing, including the exceptional golden penis sheath. Recent isotopic analyses of Varna I and Durankulak single out Varna 43 on the basis of higher trophic levels, suggesting that this individual consumed more marine protein ([Honch et al. 2006](#)). Recent direct AMS dating of 18 out of 300 Varna I burials suggests a relatively short use of this burial ground from around 4560 to 4450 BC ([Higham et al. 2007](#)). The dates are earlier than expected on the basis of typological studies and suggest that the richest burials were among the first to be

interred. Keeping in mind their extraordinary richness compared to neighbouring areas or earlier periods, what caused such a rapid change in the canons of social representation and the ability of particular individuals to accumulate goods is enigmatic. Varna is used to suggest the first incipient hierarchical and hereditary social structure in European prehistory (e.g. [Chapman 1983, 1991](#); [Renfrew 1978](#)), but perhaps it is more fruitful to discuss the opportunities for self-representation and particular types of embodiment that this burial record offers.

Cemeteries have also been found in the hinterland of north-east Bulgaria and in Romanian Muntenia. They belong to the Gumelnița culture group and consist of both extramural cemeteries (e.g. Goljamo Delčevo, Vinica, Tărgoviște) and groups of burials in settlements (e.g. Junacite; [Mazanov 1992](#)). Some single burials (mainly children) or disarticulated human bones (mostly skulls) are also found in settlements and may have been relics (for details see [Lichter 2001](#), 85–86). In contrast to the Varna culture, around 80 per cent of Gumelnița burials, males and females, were left crouched ([Radunčeva 1976](#)) with head to the east or south-east. Cenotaphs were discovered at Goljamo Delčevo ([Todorova et al. 1975](#)) and Vinica. On average, there were fewer and lower quality vessels the further away a site lies from the coastal area. Copper axes are completely lacking, and stone examples are found primarily in male burials. There are a number of copper, gold, and *Spondylus* ornaments, but overall the Gumelnița graves are ‘poor cousins’. Some regularity can be observed in the spatial division between male (eastern) and female with children (western) parts of the cemeteries at Goljamo Delčevo and Tărgoviște ([Lichter 2001](#), 125–126).

In the central Balkans and the Carpathian Basin, the burials of the Sălcuța culture were primarily found in Oltenia and in the Danube Gorges. An early lone Sălcuța burial (phase I–II) from Lepenski Vir ([Letica 1970](#)) has been dated to c. 4300 BC (see [Borić 2009](#), 237). The fifteen probable Sălcuța burials at Gârlești ([Nica 1994](#)) were flexed on their right or left sides. The only grave goods, some copper beads, were associated with two children. The largest number of burials (50 with 54 individuals) were found at the later Sălcuța cemetery of Ostrovul Corbului ([Roman 1996](#)). Most were flexed on their left, some on their right, and eastern orientations dominate. Several so-called *Milchtopf* vessels could indicate contacts with the Carpathian Basin and the Bodrogresztúr complex. Flint and obsidian blades and shell, copper, and gold ornaments were found in several graves.

The Carpathian Basin

With the beginning of the early Copper Age, a new style of pottery known as Tiszapolgár became dominant across the Alföld and the southern Carpathians. Settlement organization changed and numerous extramural cemeteries appeared. It has been suggested that large cemeteries, such as Tiszapolgár-Basatanya (Bognár-Kutzián 1963, 1972), were established and shared by distant contemporaneous settlements (e.g. Chapman 2000, 75). Yet newly investigated settlements such as Polgár-Bosnyákdomb and Polgár-Cibó-hát (Raczky and Anders 2009) were only 1–2km from Tiszapolgár-Basatanya. Other sites, such as Tibava (Šiška 1964) or Hajdúszoboszló, yielded individual burials on their periphery or in their immediate vicinity, and there are occasional intramural burials (e.g. Hódmezővásárhely-Bodzáspart (Bognár-Kutzián 1972, 37, 67–68), Tiszaöldvár (Siklódi 1983, 13), Tiszaug (Bognár-Kutzián 1963, 101–102)). Parts of some late Neolithic tells, still inhabited, were used as burial grounds (e.g. Vésztő-Mágor: Farkas 1974). There are also double burials, generally of an adult and a child (e.g. Tibava, Tiszapolgár-Basatanya).

Burials in the cemeteries of Tibava and Tiszapolgár-Basatanya were placed north–south in rows, whilst at Veľké Raškovce (Nevizánsky 1984) burials were found in groups. The position of Tiszapolgár burials is differentiated by sex/gender: male burials are placed on the right side, females on the left. Where burials are extended, as at Tiszapolgár-Basatanya, males generally have their heads turned to the right and females to the left. Children equally follow this trend. This pattern indicates the continuity of older burial traditions with possible roots in Mesolithic burial practices, but also a strongly imposed norm of sex/gender differentiation expressed through binary oppositions of left-female (facing north) and right-male (facing south). The main orientation is with head to the east, perhaps again representing older burial traditions. Cremations were found at Tibava and Veľké Raškovce and two cenotaphs at Tiszapolgár-Basatanya, one containing a pig mandible and ceramic vessels, reminiscent of some late Neolithic burials of the Carpathian Basin.

Ceramic vessels are the most frequent burial goods, with eastern Slovakia boasting more vessels per burial than areas further south (e.g. at Tibava, several burials had more than 15 vessels). The pottery is usually of high quality. Mainly adult male burials were also furnished with axes, adzes, copper, stone or antler chisels, obsidian blades, large flint nodules, copper shaft-hole axes, and wild boar tusks. Golden rings and pendants were found only in male burials in east Slovakia. On the other hand, copper finger-rings were primarily with females, and strings of beads, reminiscent of older Lengyel artefacts, were with adult women and girls. Copper, shell, and limestone beads occur in both male and female burials. Copper spiral arm-bands

mostly occur with males. At Tiszapolgár-Basatanya, domestic pigs and wild boar mandibles accompanied male individuals; five males had whole dog skeletons placed near their legs.

The contemporary Decea Mureșului group of Transylvania is characterized by burials placed on their backs, with lightly flexed legs and heads toward the south-west. The dating of a burial with a granite mace-head to the second half of the fifth millennium BC ([Govedarica 2004](#)) suggests contemporaneity with Tiszapolgár burials. Ceramics, lumps of ochre, long flint blades, and copper awls were found in several burials, alongside copper beads and necklaces and worked *Unio* sp. shells forming belt chains. Child burials are separated from adults and never receive copper awls. Various elements indicate continuities with late Neolithic Iclod and possible influences from the steppe regions to the east (see [Lichter 2001](#), 298–304). In the western Carpathians, Transdanubia, and western Slovakia, intramural burials of the Brodzany-Nitra phase of the Lengyel culture complex are known (e.g. [Nevizánsky 1985](#), 75; [Raczky 1974](#)).

It is generally believed that the early Copper Age Tiszapolgár complex in the eastern Carpathian Basin is followed by the middle Copper Age Bodrogkeresztúr complex, but both older and new dates ([Csányi et al. 2009](#); [Raczky and Siklósi 2013](#); [Yerkes et al. 2009](#)) indicate an overlap between both phases from 4500 to 4000 BC. Cemeteries with Bodrogkeresztúr pottery are also very similar to Tiszapolgár burials, as males are primarily crouched and on their right with women crouched on their left. Tiszapolgár-Basatanya contains 94 burials attributed to the Bodrogkeresztúr phase and exhibits significant continuities from the Tiszapolgár ‘phase’, such as the predominantly western orientation of burials. Osteological analysis indicates the predominance of adult individuals over children ([Lichter 2001](#), 314–316). The rare multiple burials usually contain an adult female (perhaps a mother?) with a child. Traces of fire and ochre are occasionally found. Only a handful of burials can be identified as cremations and cenotaphs, whilst partial or disarticulated bones may indicate occasional exhumations. Cemeteries usually have regular rows of graves running north–south, with the burials generally placed with the head to the east. It has been estimated that cemeteries served communities of less than 50 people ([Meisenheimer 1989](#), 65–69).

Around 50% of all Bodrogkeresztúr burials have between one and three vessels per burial, whilst about one-third have between four and six vessels, and some up to 12 vessels. It is rare to have none. Females tend to have more pottery than males. One of the most recognizable characteristics of Bodrogkeresztúr burials are the so-called *Milchtopf* vessels, often forming a set with a small cup. Shaft-hole axes, adzes, mace-heads, and chisels of copper, stone, or antler were relatively

rare. At each of the larger cemeteries there are one or two adult males with a copper and/or stone shaft-hole axe. Copper knives, flint and obsidian blades, and copper awls were found with about two thirds of right crouched males, mostly adults. Wild boar tusk blades were almost always found in male burials. The older, late Neolithic practice of placing pig mandibles in male burials survives during the Copper Age of the upper Tisza region (e.g. [Patay 1978](#)), but is also found in some burials placed on their left sides. Pointed bone and antler tools, as well as pebbles, are usually found in female burials. As with Tiszapolgár burials, adult females and girls can have identical types of grave offerings, including the rare gold ornaments found at cemeteries. More common were marble or limestone beads near the hands, feet, belt, knees, or neck of deceased women. The exceptional girdle from Szihalom-Pamlényi-tábla consisted of around 5,500 *Spondylus* beads in several rows ([Raczky et al. 1997](#), 51–53). Copper rings and arm-bands were also found. Many burials, mostly right crouched ones, also contained parts of sheep/goat, cattle, and pig. Only a few children were accompanied by such remains.

In sum, as no child burials were found with stone or copper shaft-hole axes, and assuming that these axes represent status distinctions, it seems that status for males was not hereditary but achieved through life. In contrast, gold objects are found both in burials of female adults and likely female juveniles, indicating hereditary status transmitted through the matriline. Yet, whilst these patterns are attractive for reconstructing social structure, living society and the mortuary domain are non-isomorphic and must be understood in their own right.

The middle Copper Age Lažňany group of eastern Slovakia shows affinities with the Bodrogkeresztúr type of burials, but several cemeteries (e.g. Barca, Lažňany, Šebastovce: [Šiška 1972](#)) have crouched inhumations and cremations in approximately equal numbers. As a rule, cremations were not associated with copper artefacts and had fewer flint or obsidian tools than inhumations, which were accompanied by copper knives (right-sided burials) and copper arm-bands and beads (left-sided burials). In contrast, the western Slovakian Ludanice culture group (see [Točík 1991](#); also [Pavúk and Bátora 1995](#)) does not obey strong gendered differences, and most burials come from settlement pits. There are both left and right flexed burials, generally with westerly orientations. Commonly, one to two vessels are found per burial. Both males and females could receive stone adzes or flint and obsidian blades. Some left-sided burials had small copper ornaments and *Spondylus* and marble beads. Animal bones accompanied some of the deceased.

Finally, the Balaton-Lásinja group in southern areas and on the edge

of the western Carpathian Basin has yielded several settlement burials. However, the largest number of individuals (25) came from the cave site of Ajdovska Jama, where the bones of males, females, and children were mixed with animal bones and other cultural material (cf. [Bonsall et al. 2007](#)). The nature of these deposits is open to speculation.

ORIGIN MYTHS, TASKSCAPES, BODY SURFACES

Three main aspects of the mortuary evidence from Neolithic and early-mid Copper Age south-east Europe can be singled out: i) the survival of older burial traits across the region; ii) tools/weapons placed in the construction of desirable personhoods; and iii) the social construction of body surfaces by ornaments.

Whilst the new early-middle Neolithic burial practices represent a discontinuity from Mesolithic burial traditions, especially with regard to body position, the late Neolithic sees a resurgence of extended inhumations, which at certain sites co-exist with flexed burials, and can even dominate. This phenomenon occurs across south-east Europe, but extended inhumations have not been found in the core region of the Neolithic Balkans and instead concentrate in areas where the first Neolithic communities appear only from the second half of the sixth millennium BC, such as the Black Sea coast, Dobrudža, and Muntenia in the eastern Balkans, and the northern Tisza region and parts of Transylvania in the northern Carpathian Basin ([Fig. 49.5](#)). This suggests that the descendants of Mesolithic communities in these newly Neolithicized areas actively incorporated their origin myths and beliefs into the mortuary repertoire whilst opportunistically adopting the life-styles (food-producing economy, exchange networks, etc.) and certain beliefs (exemplified by figurines) of the first farmers. This created a hybrid cultural milieu. Moreover, whilst the orientation of supine burials varies, there is a slight preference for northern and western orientations, whilst eastern and southern orientations dominate for flexed inhumations, possibly suggesting the mythical origin of these different traditions. Apart from body position and orientation, red deer canine ornaments are more frequent with extended inhumations, indicating a revival or continuity of decorative traditions widespread in Mesolithic Eurasia. Yet such ornaments often occur in the same burials as beads of a Neolithic tradition (e.g. made of *Spondylus*, limestone, etc.). Areas of south-east Europe incorporated into an expanding network of Neolithic communities only after around 5400 BC may have had more resilient Mesolithic beliefs and customs.

Certain burial offerings appear for the first time in the late

Neolithic. They set the standard for iconographic representations of gendered categories and persons across south-east Europe. Therefore, the appearance of stone, copper, and antler axes and adzes primarily in male burials and the ornament-rich burials of certain women and children could be interpreted in ways other than as wealth or status indicators. The assumption that the number and quality of burial offerings directly correlate to social positioning in life is now considered methodologically flawed. An obsessive focus on recognizing incipient social inequality within an evolutionary scheme is similarly problematic. It would be more interesting to use burial offerings to explore the structuring of gendered and age-related roles in a society, or as ways of creating social personae based on the taskscape, the everyday activities possible in a specific landscape and social milieu (cf. [Ingold 1993](#)).

A striking case of gendered social persona is the connection of tools/weapons with male burials. Although their exact position varies, axes, adzes, or sickles were often found around the head or shoulders, an iconographic ideal shared by contemporaneous figurines. Two examples from the late Neolithic Tisza culture site of Szegvár-Tűzköves are particularly telling: the famous ‘Sickle God’ ([Fig. 49.6a](#)) is a seated figure of a man holding a sickle over the right shoulder, whilst another seated but fragmented figurine also shows a man holding something over the right shoulder, perhaps the miniature shaft-hole clay axe found in the same context ([Fig. 49.6b](#)) ([Korek 1987](#); [Trogmayer 1992](#)). This position echoes evidence from burials across south-east Europe. Perhaps the clearest example comes from the Vinča culture site of Gomolava, where the deceased were always placed crouched on their left and with sickles or horseshoe stone adzes over their right shoulders ([Borić 1996](#)). In the early and middle Copper Age, copper axes and adzes were placed in these same positions (e.g. [Fig. 49.4a](#)). Instead of seeing these objects only as status symbols, we can envision them as indices of particular types of gendered persons, as norms depicting stereotypical practices such as harvesting, wood-cutting, and warring. There might have been important mythical (cf. [Makkay 1978](#)) and religious dimensions to the placement of these objects, which indicate widely shared classifications of people across south-east Europe, based on idealized taskscapes particularly pertinent to male individuals. Recently, a group of 30 (male?) figures with bird-like faces holding shaft-hole axes on their right shoulders and one larger figure holding a mace ([Fig. 49.6c](#)) was discovered in a domestic context at the Vinča site of Stubline in Serbia ([Crnobrnja et al. 2010](#)). This could be interpreted as a mythological scene, a reification of taskscapes, and/or a statement about politics and warfare.



FIG. 49.6. Tisza culture male figurines with a sickle (a) and axe (b) placed on right shoulders, Szegvár-Tűzköves, Hungary

(photo: Zoltán Pápai, Koszta József Múzeum, Szentes); (c) group of late Vinča culture figurines with a mace-head and axes placed on right shoulders, Stubline, Serbia (courtesy A. Crnobraja).

Body ornaments are largely absent from early-middle Neolithic burials, but become more frequent in the last centuries of the sixth millennium BC. As with tools and weapons, beads of ‘exotic’ raw materials like *Spondylus* shell or copper have frequently been taken as indications of higher status, or hereditary status when associated with children. There is an overwhelming gendered division regarding the types of ornaments found in burials: *Spondylus* and copper bracelets, and wild boar tusk pendants, are found in male burials; beads and appliques of marble, *Spondylus*, *Dentalium*, limestone, clay, and red deer canines were more frequently buried with women and children. Hence different types of body ornaments were used to signal particular social messages, for example about life-stages of particular individuals (Sofaer Derevenski 1997, 2000), or their possible

achievements and ‘fame’. Whilst bead-making, especially from exotic raw materials, required energy and resources, body decoration cannot be reduced to concerns about status, wealth, and social exchanges, or even to gender and age signalling. For instance, a whole genre of Amerindian myths is concerned with the origin of ornaments seen as bodily extensions or protective surfaces with important religious dimensions (e.g. Lévi-Strauss 1995). For the Nambikwara of Brazil, especially the ornaments worn by children are important for protecting or representing the soul of the wearer, and losing them could cause illness or death (Miller 2009). Ornaments can thus be seen as creating body surfaces with inscribed social messages regarding an individual’s social and age/gender standing, but can also act as extensions of one’s body. Body surfaces in life and death must have been inscribed by numerous messages, acting as interfaces between the individual and society, and differentiating diverse communities across Neolithic and Copper Age south-east Europe which, at the same time, shared similar myths and beliefs.

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NOTES

1. In contrast to other chronological schemes, the label ‘middle Neolithic’ is used for the period following the earliest phase of the Neolithic in the Balkans and lasting from c. 5900–5400 BC, i.e. up to the appearance of the first late Neolithic tell sites in some areas, when a markedly different pottery production was introduced throughout the region. As with all chapters in this volume, dates given are cal. BC.
2. There were 23 burials at Nea Nikomedeia, around 20 at Lepenski Vir and Malák Preslavec, 17 at Ajmana, 13 at Karanovo and Trestiana, and 10 or 11 at Vinča, Szarvas-Szapannos and Gura Baciului.
3. Some burials from the largely late Neolithic Dudești culture cemetery at Cernica or from Durankulak could be attributed to this phase, but this is unlikely (see below). In the southern Balkans, the presence of 14 cremation burials close to the Soufli *magoula* may indicate an intramural cemetery

- (Gallis 1982; [Perlès 2001](#), 274; cf. [Fowler 2004](#); [Triantaphyllou 2008](#)). Individuals of both sexes and various ages were accompanied by miniature vessels and broken pieces of pottery.
4. A possible exception to this rule could be certain burials from the largely late Neolithic cemetery of Dudești culture at Cernica or certain burials from Durankulak could perhaps also be attributed to this phase, yet presently there are no indications for this (see below for the late Neolithic mortuary practices at these sites, cf. [Lichter 2001](#), 39). In the southern Balkans, the presence of 14 cremation burials at Soufli close to *magoula* may indicate that this was an extramural cemetery (Gallis 1982; [Perlès 2001](#), 274). Burning of human remains might have taken place in burning pits discovered in the same area. These burials at Soufli contained individuals of both sexes and various ages and were accompanied by miniature vessels and broken pieces of pottery.
 5. Only in the Poljanica culture were goods preferentially placed around the feet, see e.g. [Todorova 1982](#).
 6. Here, several of the deceased were buried in coffins, e.g. at Hódmezővásárhely-Gorzsa II ([Horváth 1987](#)) and Vésztő-Mágor ([Hegedűs and Makkay 1990](#)).
 7. The term Copper Age is used here, but ‘Eneolithic’ is also common in the literature. The latter term stresses the evident continuities with the late Neolithic, but some authors have argued that the Copper Age should be seen as a separate historical epoch bringing important social changes ([Lichardus and Echt 1991](#); [Link 2006](#); [Parkinson 2006](#)). Furthermore, whilst copper use is clearly attested during the late Neolithic in various areas of south-east Europe (e.g. [Borić 2009](#)), it peaks in the millennium after around 4500 BC and various culture groups conventionally labelled ‘Copper Age’ lasted for around 2,000 years until the beginning of the earliest Bronze Age.

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CHAPTER 50

BURIAL AND HUMAN BODY REPRESENTATIONS IN THE MEDITERRANEAN NEOLITHIC

JOHN ROBB

INTRODUCTION

FEW areas of Neolithic Europe offer the rich and varied panorama of human bodies in burials and in ‘art’ that we find in the central and western Mediterranean. This chapter reviews the treatment of the dead and the depiction of the living between 6000 BC and 2500 BC.¹ After a broad review of the relevant archaeology, we conclude with a discussion of some important theoretical issues the body raises.

Unhelpfully, archaeological terminology varies from country to country. In the area covered in this chapter, the period in question is known as the Neolithic up to about the mid to late fourth millennium, and from then as the Copper Age through to about 2400 BC, the transition to the Bronze Age. The largest discrepancy in terminology concerns the Maltese Islands, where the period from 3600 to 2400 BC—contemporary with the Copper Age in nearby Sicily and southern Italy—is included with the Neolithic; it is also known as the ‘Temple Period’ due to its florid architectural developments. This long period encompasses many social changes and is far from homogeneous. In the central Mediterranean, the Neolithic began at varying points, from probably slightly before 6000 BC in the south-eastern corner of Italy, is evident around 5700 BC at many points around the coastline of Italy, Sicily, and Sardinia, and reaches the Alps around 5000 BC. It thus took over a millennium for the process of Neolithicization to traverse the peninsula from south-west to north-west and from coasts to mountains. Whilst the Neolithic of the central and western Mediterranean varied greatly, as a gross generalization it was economically based upon farming and pastoralism with little contribution from hunting and gathering. The remarkably consistent range of archaeological material culture includes often quite ornate

pottery, polished stone axes, a generally unimpressive blade-and-flake based lithic assemblage, grinding technologies, and personal ornaments. Variation between regions is mostly visible in forms of settlement (which vary from isolated houses to quite large villages), in some ritual practices, and sometimes in burial.

Sometime in the fourth millennium, a general transition is visible throughout the region. Although abundant archaeological evidence suggests a continuous in situ development, there was a general sea-change from one kind of prehistoric society to another. The features of European society from the fourth millennium onwards include settlements which are much less visible archaeologically and were probably less substantial and more dispersed; an economy which probably included a more specialized pastoralism component, formal extra-mural cemeteries, and long-distance exchange in new media such as metals. These developments were often foreshadowed by a late or final Neolithic such as the Diana culture in southern Italy and the Lagozza-Chassey culture in northern Italy and southern France. These are marked by settlement changes, widespread horizons of material culture, and experiments in more formal burial. For these reasons, these two general periods (6000–3500 BC and 3500–2500 BC) are discussed separately in this chapter.

The body was central to social life in both periods. In this chapter I review the two most direct sources of evidence for the body in this period—burials and human representations in ‘art’—highlighting both general trends and some important local developments. Neither one gives us a universal key for unlocking the social constitution of the body, and both often reference it in very narrow contexts, but it is still useful to put them into relation.

ITALY

Burial 6000–3500 BC

For most of Italy and Sicily, Neolithic burial before 3500 BC is marked by a combination of a fairly simple basic rite and abundant, often unique variations. The published record is normalized, as single primary inhumations are traditionally identified as ‘burials’ and well-published whilst variants resulting in disarticulated or re-deposited remains tend simply to get written off as ‘disturbed burials’ without careful interpretation. Nevertheless, the general picture is clear ([Robb 1994a](#); [Robb 2007](#), [ch. 3](#)).

Burial happened most commonly around villages and settlements,

although human bones are often found in caves as well. The basic mode of deposition was a single inhumation, lying flexed upon its side in a shallow pit with no preserved grave goods or architecture. Burials were made around houses and, in areas of southern Adriatic Italy where people lived in ditched villages, in the ditches around houses and villages as well. Such burials are often found disturbed, and this evidently happened during the Neolithic sometimes, which suggests that burials were not marked permanently above the ground and that there was little concern with maintaining them beyond a certain span of social memory.

From the start of the Neolithic, unique burial variants are known, for instance with the elaborate cremation of four individuals at the Grotta Continenza in the highland Abruzzo ([Grifoni Cremonesi and Mallegni 1978](#)). As the Neolithic developed, there was increasing experimentation with variant ritual procedures. Formal burial areas distinct from settlements are found, sometimes with burials, including cemeteries such as at Quinzano and Chiozza da Scandiano in the north and the Pulo di Molfetta in the south. Some cave sites repeatedly used for burials, such as Arene Candide in Liguria ([Bernabò Brea 1946](#)), should probably be considered as cemeteries too. One of the most interesting trends here is that earlier Neolithic sites were sometimes revisited and used as burial sites later in the Neolithic; about 15 examples are known, of which Serra Cicora in the Salentino peninsula ([Ingravallo 2001](#)) is the best-documented. This suggests that people maintained a connection between specific places and the history of their group and used burial to maintain that connection even when their actual mode of settlement had changed. Moreover, although grave goods remain far from common, there is increasing use of them, for instance at Chiozza da Scandiano in the north, where axes and pottery in graves recall practices in central Europe; burials at sites such as Serra d'Alto, Masseria Candelaro, and Vulpiglia sometimes included Serra d'Alto style vases. Third, there are a large number of non-standard settings in which human remains are found. These include, among others, as isolated or disturbed bones, as bodies with the skulls removed, as skulls removed from bodies, as exceptionally elaborate ritual depositions, as exposed, unburied bodies, and as mass burials. Although only one or a few examples are known of each, they add up to a burial programme of great variety. This probably reflects the negotiation of a conceptually simple transition from a small, local, social world of the living to the merging of the local dead and the history of the village; variant procedures probably reflect, among other things, a reaction to the contingent circumstances of death and burial ([Robb 2002](#)).

Burial 3500–2500 BC

Changes in burial are one of the most prominent parts of the fourth millennium transition. Throughout Italy, settlements become less visible archaeologically; burial sites become more prominent, to the point where the type sites for almost all Copper Age cultures are cemeteries. The shift began before the onset of the Copper Age around the mid fourth millennium; the rise of burial sites, often caves, distinct from habitation sites is evident in the last phase of the Neolithic from late in the fifth millennium, particularly in the Diana culture of southern and central Italy and the Lagozza-Chassey culture of northern Italy. Rudimentary tomb architecture is found, and an associated innovation is the deposition of several individuals within the same tomb, usually sequentially.

There is both variety and common themes in Copper Age burial. In Sicily the most common form is the *tomba a forno* in which a short shaft leads to a small oven-shaped chamber, as at Piano Vento ([Castellana 1995](#)) and many other sites. In southern Italy, Copper Age burials occur both in rock-cut tombs and in caves. The best-understood manifestation is the Gaudio culture of Campania ([Bailo Modesti and Salerno 1998](#)), characterized by cemeteries of up to 20 collective underground rock-cut tombs (*tombe a grotticelle*), with one or two chambers each of which contained on average between nine and ten individuals, with abundant goods. The shaft was both for access and for ritual, with the deposition of broken vases, whilst both articulated and disarticulated skeletons and grave goods are found within the chambers. Disarticulated skeletons were rearranged and occasionally recomposed in the final phases of rituals. Detailed study of the burial rites shows that articulated skeletons are usually male, whilst disarticulated skeletons show a balance of males and females. Male gender ideology is also represented in the elaborate and fine flaked flint daggers and arrowheads. A similar pattern is found in the rock-cut tombs of the Rinaldone group in Lazio and Toscana ([Dolfini 2004](#)), which, however, are also characterized by metal goods, predominantly pins, daggers, and axes. Further north, collective burial in caves characterizes Liguria and some areas of the Alps; central Adriatic Italy and the Po Valley have cemeteries of single graves (the Conelle and Remedello groups respectively: [Bagolini 1981](#); [Barfield 1985](#); [Cazzella 2003](#); [Corrain 1963](#); [Manzi et al. 1997](#)). The latter is characterized by a standardized grave goods assemblage similar to those of Corded Ware/Beakers, with drinking vessels, flaked flint daggers, and arrowheads. Further north in the Alps, there are occasional megalithic tombs similar to those in western Europe. Copper Age burial sites vary, but it would be wrong to see collective

vs. single burial as the major dividing line. Instead, both 'collective' and single burial cemeteries involved the creation of a particular space dedicated to the dead, with successive burials being placed within it accompanied by kits of status and gender-marked grave goods; the difference, more apparent than significant, simply results from extent to which successive burials displaced earlier ones.

The common themes are burial structures accommodating the accumulated and sometimes rearranged remains of many individuals, and familiar genres of grave goods including weaponry, ornaments, and drinking vessels. These show the increasing formalization of death and its use to mark landscapes and fix their relationship to groups of people.

The human body in art

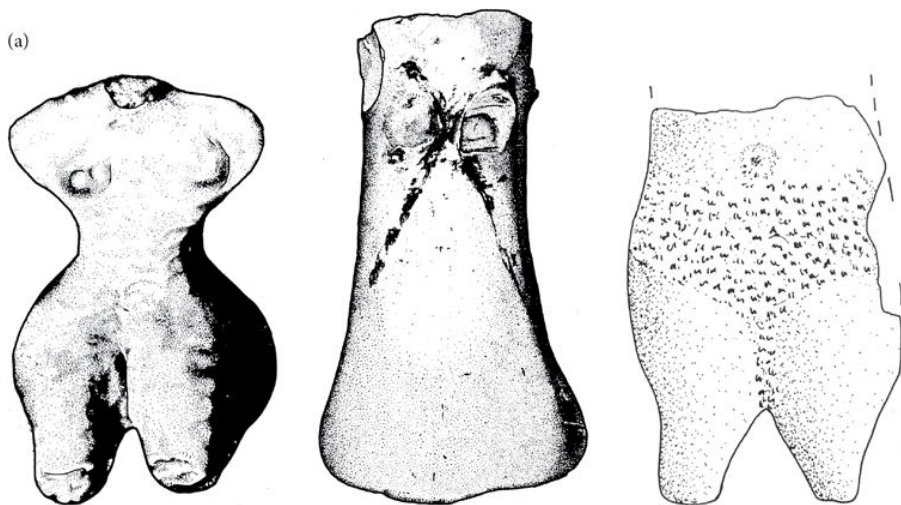
Italy is rich in prehistoric art, with new discoveries ongoing ([Graziosi 1974](#); [Istituto Italiano di Preistoria e. Protostoria 1992](#)). For most of the Neolithic, representations of the human body are found principally in small clay figurines ([Fig. 50.1](#)). Between 50 and 100 of these are known, depending upon the criteria used to define them ([Fugazzola Delpino and Tinè 2003](#); [Giannitrapani 2002](#); [Holmes and Whitehouse 1998](#); [Robb 2007](#), ch. 2). Figurines are found at Neolithic sites throughout Italy and Sicily, although, unlike in the Balkans, only one or a few are found at any individual site; this may reflect the relatively small volume of excavation at Italian sites as opposed to Balkan tells, or it may reflect a genuine social cause. Figurines are normally found broken among household debris; whilst what figurines were used for is unknown, the best guess is that they were relatively context-specific paraphernalia for a periodic rite of some kind.

All Italian Neolithic human figurines for which a gender can be deduced are female; most of the rest are fragmentary and may have simply lost the gender-specific zones. A few apparently ungendered examples with elaborate coiffures may represent special persons of some other kind, perhaps in the same way as the elaborately coiffed Maltese examples a millennium or more later. Whilst they are sometimes interpreted as evidence of a 'Mother Goddess' tied to early farming groups' concern for the fertility of the earth ([Fugazzola Delpino and Tinè 2003](#)), a simpler explanation is that Neolithic people probably made a variety of human representations for different purposes and by chance the ones made of a lasting material happened to be female. A more striking fact about the figurines is their stylistic heterogeneity; they differ strikingly from site to site and there are very few recurrent 'types'. For example, they have no common template governing which parts of the body were represented and what features

on them were important to depict. Following Barth's model for the reproduction of knowledge (Barth 1987), this suggests that they were made relatively infrequently for internal, possibly private purposes, by small, highly local communities of practice. Moreover, it may be the case that the definition of the body/person was situation-specific or contextual.

Figurines go out of use at the end of the Neolithic, except for a very few examples (including, intriguingly, two male ones at Ortucchio and Piano Vento). However, human representations are known from parietal art and statue-stelae. Cave paintings at Porto Badisco cave (Graziosi 1980) in the Salentine peninsula show males hunting deer with bows and females (indicated by a dot between the legs) in a repeated posture, possibly dancing. They are not definitively dated but the best guess from pottery found in the cave is the late Neolithic/transition to the Copper Age.

(a)



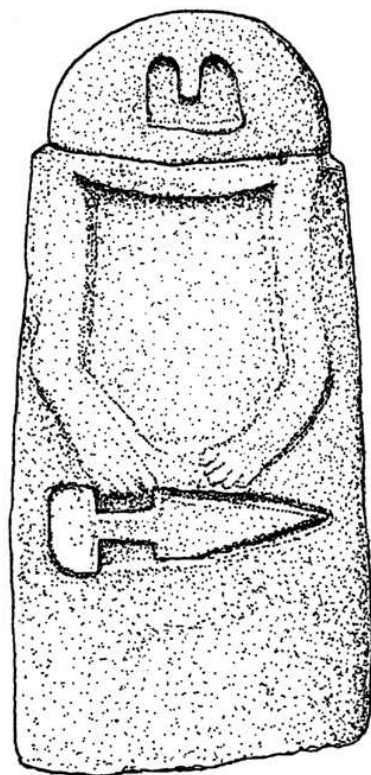
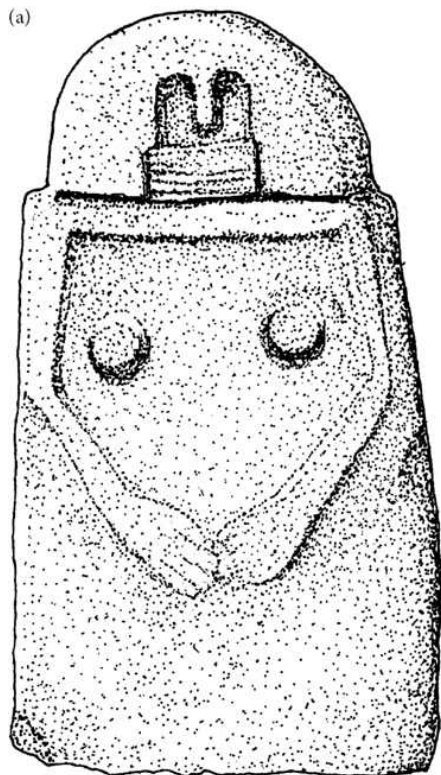
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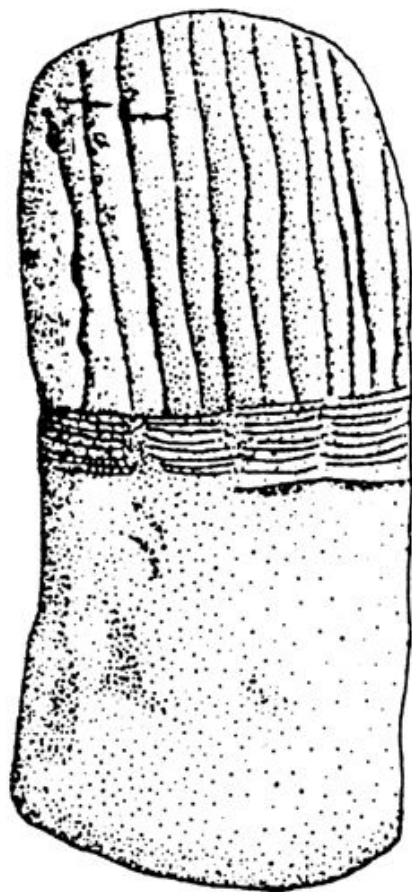
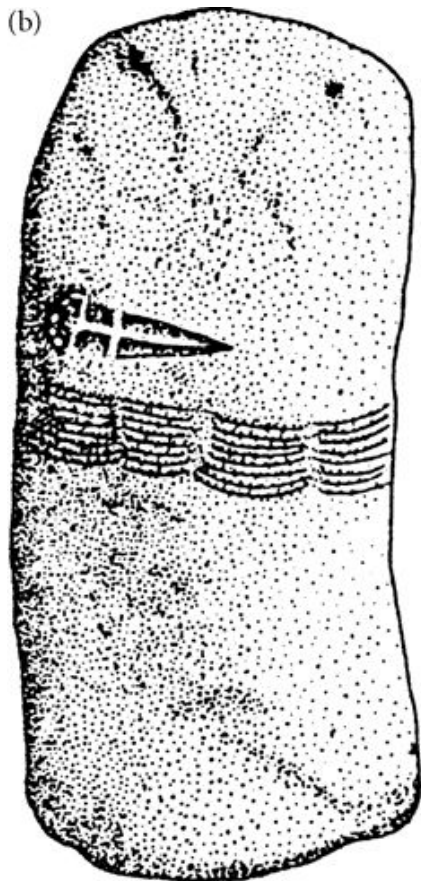
FIG. 50.1. a. Early-middle Neolithic figurines: Arene Candide (redrawn after [Graziosi 1974](#), fig. 114c), Catignano (redrawn after [Tozzi and Zamagni 2001](#), fig. 50.1), and Rendina (redrawn after [Cipolloni Sampò 1982](#), fig. 39); b. Cave art, Porto Badisco ([Graziosi 1974](#), fig. 157).

Aside from a few other caves with isolated paintings, the other site is Levanzo, off the western tip of Sicily, dated very shakily to the Copper Age, where a panorama of paintings represents possible anthropomorphs, abstract motifs, and what may be the world's earliest representation of a tuna ([Graziosi 1962](#)). At more or less the same time, petroglyphs on exposed rock faces begin to be made in the Alps, particularly at Valcamonica and Valtellina ([Fossati](#), this volume). These continue until the Iron Age, and the phasing is not entirely clear. It appears that Neolithic representations include a relatively restricted range of geometric motifs and anthropomorphs, some in the 'orante' position with hands raised; a line of women (indicated again by a dot between the legs) at Naquane may be engaged in a dance. In the Copper Age the repertory was broadened with images of weaponry, particularly daggers, 'solar' motifs of concentric circles or circles with radiating lines, and animals. Inasmuch as the cave and rock art lends itself to social interpretation, it underlines the renewed social (if not economic) importance of hunting as a gendered activity in the fourth millennium BC.

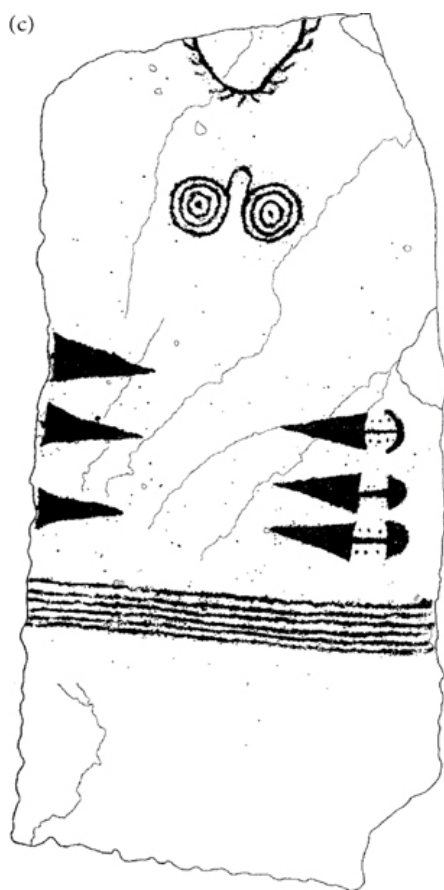
(a)



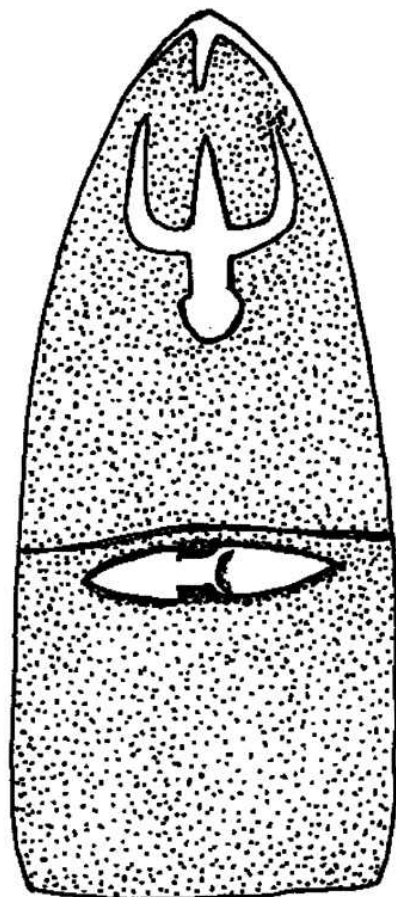
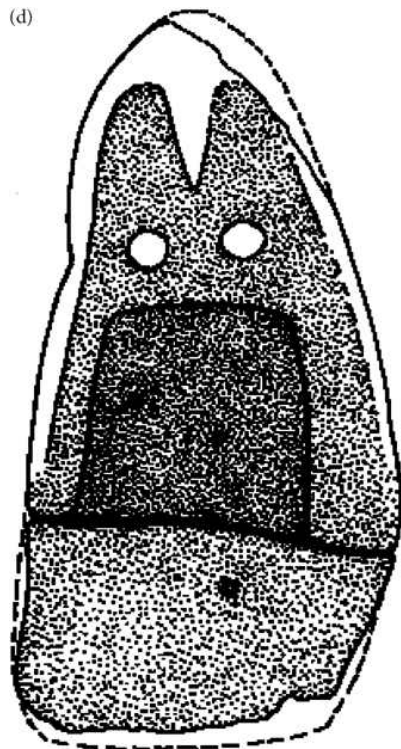
(b)



(c)



(d)



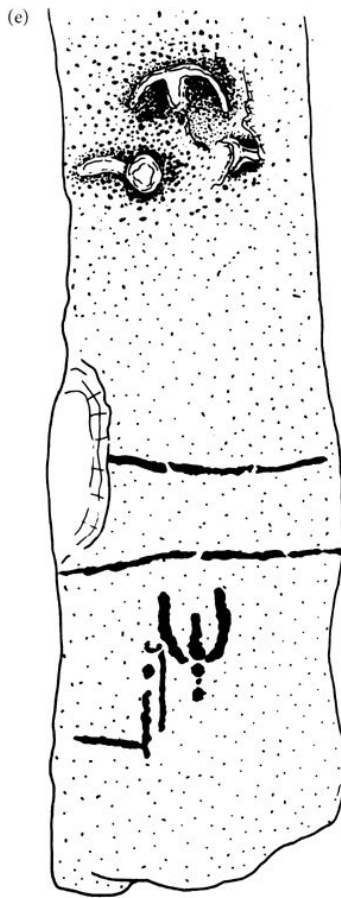


FIG. 50.2. Statue-menhirs and statue-stelae. a. Lunigiana (Italy) male and female (Robb 2009, fig. 3); b. Trentino (Italy) (front and reverse shown) (Robb 2009, fig. 3); c. Valcamonica (Italy) (Robb 2008, fig. 3); d. Laconi, Sardinia (Atzeni 2004, fig. 52 (female), fig. 16 (male)); e. Dolmen de Soto, Huelva (Shee Twohig 1981, fig. 71; for orientation see Bueno Ramirez 1995, 115).

Statue-stelae are a new genre of human representation which appears to arise in many places in Europe in the third millennium BC (Casini et al. 1995; Casini and Fossati 2004) (Fig. 50.2). These are flat, tabular stone statues, generally 1–1.5m tall, which were erected in groups or alignments in open countryside. They are visually simple, following a very schematic template for depicting the body. Gender is shown in a straightforward binary way indicated by weaponry for males and breasts and necklaces for females (Robb 1994b; Whitehouse 1992); occasionally clothing is depicted too. Elsewhere in Europe they were associated with burial sites, and they may represent ancestral beings. The association with burial is clear for two of the five Italian groups dating entirely or partially to the third millennium (Robb 2008). The Val d'Aosta/Canton Valais group which spans the Italian–

Swiss border is known at two megalithic burial sites (St. Martin de Corleans and Sion, the latter with both pre-Beaker and Beaker components). The numerous Valcamonica/Valtellina group has been termed 'statue-menhirs' (e.g. unshaped or only crudely shaped blocks with anthropomorphic designs carved upon them, in contrast to the carefully shaped 'statue-stelae'). They also differ markedly from the other groups in having a much less rigid anthropomorphic template, sometimes appearing simply as accumulations of imagery akin to the rock art of these two valleys. Whilst they may have had other roles, careful excavations at Osimo-Anvoia (Fedele 2004) have shown that they were used in rituals during which some previously cremated human bone was re-deposited. Among the other groups, there is the Alto-Adige group north of Trento of about two dozen stelae; the Lunigiana group of stelae in the hinterlands of La Spezia which continues through the Iron Age; and in the far south a group of about a dozen stelae at Bovino in Puglia.

As a form of representation, statue-stelae underline several aspects of the fourth/ third-millennium BC transition mentioned above (Robb 2008, 2009). Whilst gender associations such as the association of weaponry with males probably pre-existed the Copper Age, the statue-stelae underline the politicization of such values. Moreover, emphasis in depicting the body shifts from showing it as heterogeneous and corporeal to showing it as following a standardized template in which body parts are subordinated to a vision of the whole; the body itself is reduced to a flat surface for display. Display focuses upon key pieces of material culture which are known from other contexts such as burial, exchange, and dress in everyday life and which probably formed part of an individual's *habitus*. The effect may be to replace a situation-specific concept of personhood with a standardized, cross-context personhood based upon political relations, exchange, and display. The statue-stelae also underline the trend seen throughout Europe at this time (for instance in megalithic structures) of decorating the broader landscape with large stone references to ancestral presence.

The Ice Man

One cannot discuss the body in Neolithic Italy without mentioning the most famous and intensively studied prehistoric European body of all, 'Ötzi' or the Ice Man, from the South Tyrol (Höpfel et al. 1992; Spindler 1995; Spindler and Osers 2001). This body, naturally mummified beneath a glacier, which not only has soft tissues such as hair and skin preserved but is also associated with an assemblage of clothing and personal gear, was found in 1991 about 100m inside

Italian territory, just south of the Alpine watershed between Italy and Austria. The Ice Man was an adult male who lived sometime between about 3300 and 3000 BC, at the transition between the Neolithic and the Copper Age. From isotope studies and stomach contents, we know that he lived in the high Italian valleys south of where he was found. He died at around 45–50 years of age, a considerably advanced age for the time, in unusual circumstances. When he died, probably in late spring, he was carrying a complete kit of travelling gear including cold-weather clothing, weaponry (including a bow and quiver-full of arrows, a copper axe, and a bifacially flaked stone knife kept in a woven grass sheath), fire-making equipment, some general-use stone tools, and some items whose purpose we do not understand. Puzzlingly, his arrows and bow were unfinished and unready for use. Shortly before he died, he was shot in the left shoulder with a stone-tipped arrow whose head remains embedded in the body; he may also have a cut wound on the hand. He was not buried, but appears to have died of wounds and hypothermia where he was found, in a remote, uninhabited high Alpine pass. These circumstances have inspired a rife ‘What killed Ötzi?’ industry, with many hypotheses about him fleeing warfare and the like.

What have we really learned from this sensational discovery? The body itself has been influential in putting a face upon people of this time, particularly in details such as how his hair and beard looked. It provides the earliest evidence for tattooing known, in the form of small lines and crosses upon his lower back, knees, and ankles; these have been interpreted as medical therapy for osteoarthritis, but the logic of this is not particularly convincing and it is more likely that they represent some social marking of the body ([Renaut 2004](#)). Arguably more important has been the remarkable ensemble of things in wood, leather, fur, and grass found with the body. The remarkable organic preservation allows them to demonstrate many things we could otherwise only guess at, such as how knives were carried attached to the body (in a small woven grass sheath probably hung from the belt). Similarly, the Ice Man provides virtually our only vision of Copper Age costume; he was wearing an under-layer of a belt, loincloth and leggings, a striped knee-length tunic of strips of dark and light animal skin sewn together, a voluminous woven grass cape for outer insulation, a bearskin hat, and leather over-shoes lined with grass. Interestingly, it includes no woven cloth, just animal skins; whether or not this has implications for the ‘secondary products revolution’ depends upon how much weight one wishes to put upon a single example. Moreover, the Ice Man’s kit is a remarkable assemblage in that, unlike settlement finds, it is a set of items associated with a single individual at a single moment; unlike burial

goods, however, it is not consciously assembled for ritual purposes. It thus tells us much about how ordinary life was lived; for example, it reinforces the association of weaponry with males, and shows that the armed, potentially violent body depicted in stelae was also lived in other contexts. Similarly, not only do the Ice Man's clothing and kit provide him with a well-made, functional outfit for high-altitude mountaineering; they also show a keen use of colour, design, and citation to create a social body in a way which bears strong parallels to bodies depicted in the slightly later statue-stelae of the region (Robb 2009).

THE CENTRAL MEDITERRANEAN ISLANDS

The Maltese Islands

Malta and Gozo remained uninhabited until probably sometime around 5000 BC, when they were settled by Neolithic colonists from Sicily, about 100km away by sea. For another millennium or so, the scanty evidence suggests that the Neolithic Maltese lived a life very similar to Sicilians and southern Italians. No burials have been recovered on Malta and Gozo from before around 4000 BC, although a few disarticulated human remains were found out of context at Ghar Dalam Cave, the type site for the islands' earliest phase (Evans 1971).

The islands began to distance themselves culturally from Sicily and the mainland around 4000 BC with the transition from the Red Skorba style (which bears parallels with the contemporary Diana style) to the Zebbug style of pottery. In this phase, two sets of rock-cut tombs are known, at Ta Trapna (Zebbug) on Malta and at the Xaghra Circle (also known as the Brochtorff Circle) on Gozo. Both were underground chambers accessed through a vertical shaft; collective, disarticulated burials were accumulated in them, accompanied by grave goods and ochre. In the latter (Malone et al. 1995), at least sixty-five individuals had been buried, in two small chambers. Interestingly, at both of these sites an anthropomorphic statue was found which strongly resembles the stelae in the stylization of facial features, although this is somewhat earlier than the stela tradition elsewhere in Europe.

Around 3600 BC—whilst surrounding areas were entering the Copper Age—the Maltese Islands entered the most distinctive period of their prehistory, the later Neolithic or 'Temple Period', spanning the Ggantija, Saflieni, and Tarxien phases (Evans 1971). This lasts until about 2400 BC, when it is truncated by the quite different looking early Bronze Age Tarxien Cemetery culture (see Malone, this volume).

Burial in the Temple Period continued the tradition of using rock-cut tombs for collective burials, for instance at Xemxija. However, two super-burial sites are known, the Hypogeum of Hal Saflieni on Malta (Evans 1971) and the Brochtorff Circle at Xaghra on Gozo (Malone et al. 2013). These may be associated with exceptionally large and elaborate temples nearby at Tarxien and Ggantija respectively. The Hypogeum of Hal Saflieni is a galaxy of artificially cut underground rooms on three levels, some with elaborately carved decorations mirroring the above-ground megalithic buildings of the temples. Several rooms have wall paintings in red ochre, and abundant red ochre, fine pottery, figurines, miniature ritual axes and other material culture was found. Supposedly the Hypogeum contained the remains of some 7,000 individuals; however, excavations were early in the century and poorly controlled, and only about two dozen skulls were kept. The Brochtorff Circle at Xaghra, more recently and carefully excavated, gives much more detail upon burial. Here several thousand people were buried. Most bodies were disarticulated; patterns of articulation, part representation, and other evidence suggested that each body was moved after some time to make room for further burials, but in some cases long bones and skulls were retained (Malone et al. 2013). A number of altars suggest cult practices and human figurines were abundant.

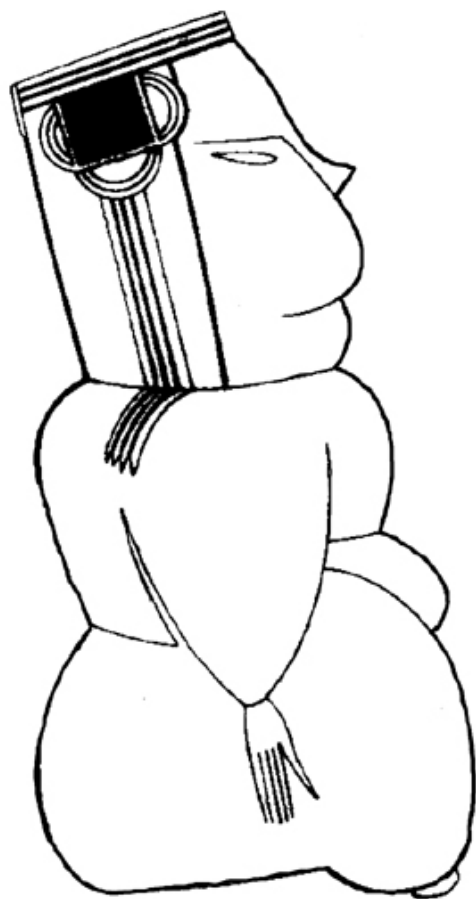
Malta is remarkable in how many human bodies are represented in 'art' and how different they all are (Vella Gregory and Cilia 2005). Before the temple period, a handful of small clay female figurines from Skorba (Trump 1966) generally parallel ones known in Italy and Sicily. In the temple period, there are figurines of both clay and stone, and monumental statues in stone. A common theme is a massively fat person, sometimes wearing a distinctive, knee-length pleated or striped skirt, either standing or sitting. These occur in hand-held sizes (for instance, a model of a pair of these persons was found upon an altar at the Brochtorff Circle at Xaghra) and in massive forms; the bottom half of one such being, found at Tarxien, measures 1.4m to the waist. The heads are often detachable and modelled with a formal hair-style and somewhat severe features. The gender of these persons is arguable; although they have traditionally been interpreted as females, there are no direct anatomical references and there are enough undoubted female figures to underline the point that Maltese artists were fully capable of modelling the female body when they wanted to, suggesting that the absence of identifiable female traits is meaningful. The key theme is their hyperbolic corpulence, which may have been associated with fertility, social productivity, or authority. Besides these, Maltese Neolithic figurines include a wide range of females, including the 'Sleeping Ladies' (corpulent women reclining

upon a couch or bed); small, extremely schematic anthropomorphic pendants (isolated heads which once may have been placed detachably upon model bodies); phalluses; and the unique assemblage of nine small hand-held stone figures, mostly human, from the Brochtorff Circle at Xaghra which have been interpreted as a set of tools for ritual performances ([Malone et al. 2013](#)).

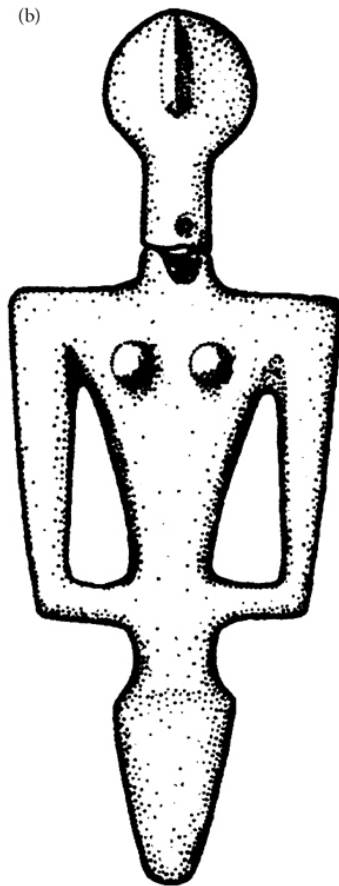
Sardinia and Corsica

Whilst Sicily's prehistory can generally be grouped with that of southern Italy, the other two large islands of the central Mediterranean follow divergent trajectories. Here, only a few relevant points can be touched upon ([Atzeni 1982](#); [Camps 1988](#); [Lewthwaite 1983](#); [Lilliu 1988](#)). Burial is poorly known for the earlier Neolithic, and (as in Italy) is varied for the middle Neolithic. In Sardinia, for example, disturbed cave burials are known at the Grotta Rifugio di Olieni, whilst at the village site of Cùccuru S'Arriu di Cabras a cemetery of rock-cut *grotticella* tombs was found, each containing a single burial, often with some grave goods, some including figurines. The same cemetery also contained burials in pits and other kinds of structures. The best-known Neolithic burials occur in the succeeding late Neolithic (Ozieri) phase with the elaborate *domus de janas* tombs such as Anghelu Ruju, Sas Concas, and Santu Pedru, hundreds of which are known throughout Sardinia. These are underground rock-cut tombs of a unique form: a horizontal entrance passage cut into a bank leads to an ante-chamber, from which small doors like square portholes lead into one or more burial chambers. Many *domus de janas* tombs were decorated with skeumorphic features carved into the stone representing elements of wooden architecture such as beams; they are often also painted or carved with ox-horns, spirals, and other motifs. *Domus de janas* tombs were often re-used in succeeding periods for long time-spans. Unfortunately, few have been excavated carefully, and it is generally assumed rather than documented that the typical burial practice was repeated single inhumation resulting in a mass of disarticulated bones. In the late fourth and third millennium both islands see the rise of megalithic burials proper; the earliest phase of this typically consists of cist-like burial chambers surrounded by a round cairn as at Li Muri; the site of Pranu Meteddu on Sardinia provides an exceptionally elaborate example associated with circles and alignments of menhirs. Rock-cut tombs continue in use in some areas, as in southern Sardinia. Long corridor dolmens follow in the Bronze Age.

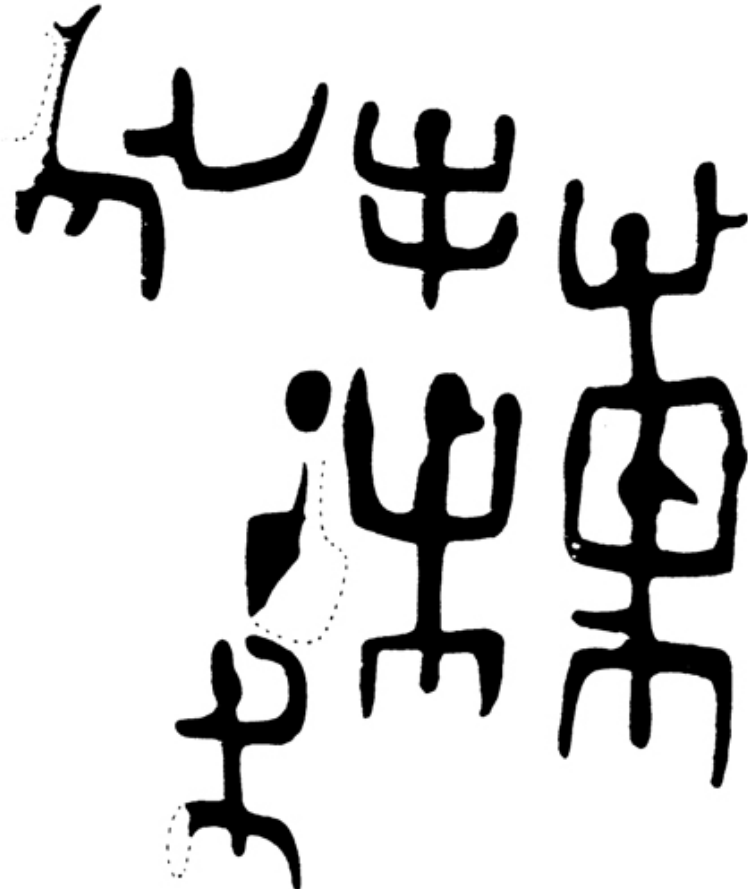
(a)



(b)



(c)



(d)

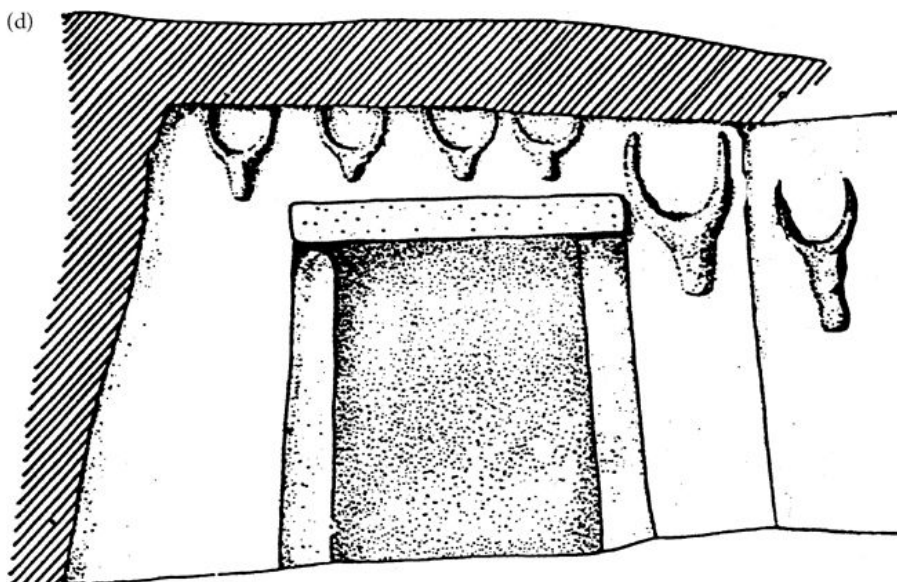


FIG. 50.3. Prehistoric body imagery from Sardinia. a. figurines: middle Neolithic

‘volumetric’ style, Cuccuru S’Arriu ([Santoni 2000](#), fig. 50.3); b. schematic late Neolithic–Copper Age style, Portoferro ([Pessina and Tinè 2008](#), fig. 9.3); c. ‘orante’ (praying) human figures in late Neolithic ‘domus de janas’ tombs, Tomba Branca ([Tanda 2000](#), fig. 10); d. cattle imagery, Anghelo Ruju ([Contu 2000](#), fig. 14).

Human representations are common ([Fig. 50.3](#)), and shift genres in ways parallel to elsewhere in the Mediterranean. Sardinia’s rich figurine tradition ([Lilliu 1999](#)) begins with the ‘volumetric’ figures of the middle Neolithic Bonu Ighinu culture. These small stone or clay figures present human figures, not obviously gendered but often taken to be female, in a standard, very blocky robust form with peculiar, elaborate headgear; they are often found in burials. In the subsequent Ozieri phase, female figures evolve to an increasingly schematic form, and by the end of the tradition they include highly schematic figures such as the famous ‘Venus of Senorbi’, often of marble, with only breasts and nose breaking the flatness of the body. At about the same time, in the later fourth millennium, monumental forms emerge in both Sardinia and Corsica ([Atzeni 2004](#); [Lilliu 1999](#); [Weiss 1990](#)). Menhirs are known from the middle Neolithic onwards, often associated with funerary constructions, and from the beginning of the Copper Age these begin to take on anthropomorphic features. Genuinely anthropomorphic statue-menhirs and statue-stelae similar to those found in Italy and southern France, with faces, anatomical features such as breasts, and weaponry and other images carved upon them, are found throughout the third millennium BC. Statue-stelae are known sporadically throughout Corsica and Sardinia; the densest concentrations are found at Laconi in central Sardinia, dating to throughout the third millennium, and at Filitosa in southern Corsica, where they may originate in the Copper Age but are archaeologically associated with a Bronze Age village.

IBERIA

The prehistory of the Iberian Peninsula exhibits both generic parallels with that of the central Mediterranean and important differences. As in Italy, the transition to the Neolithic was a protracted process taking place over a millennium or more (between about 5700 BC in coastal Catalonia and along the Mediterranean coast and 4500 BC in far north-western areas). There followed a millennium or more of Neolithic life before a second set of sweeping transformations around the mid to late fourth millennium BC ushered in the Copper Age. These changes are most famously marked in the Los Millares group of south-eastern Spain and in large, fortified Copper Age sites of western

Spain and Portugal (e.g. La Pijotilla, Zambujal, and São Pedro di Vilanova) but also characterize other areas of Iberia ([Chapman 2008](#)).

Prehistoric Iberia is amazingly rich in ‘art’ of all kinds, particularly for representations of the human body. Rock art is poorly dated, but most of it can probably be placed within the Neolithic and Copper Age. The three major traditions of painting within caves are Levantine, schematic, and macro-schematic art, and the major tradition of carving upon rock faces in open-air sites is Galician-Atlantic art. There is also a substantial number of both carvings and paintings found upon stones in megalithic structures ([Sanchidrián 2005](#)). These various traditions are described by [Fairén-Jiménez](#), this volume, and here only their implications for human body representations will be touched upon. Supplementing these, the human figure is also known in occasional designs upon pottery, mostly from the Neolithic, and in a wide range of small figurines. Finally, Iberia has a strong tradition of human representations in statue-stelae; although most of these date to the Bronze Age, some appear to date to earlier periods. For Italy, it made sense to discuss burial and ‘art’ separately, but for Iberia this is much more difficult. As we will see, there are close parallels and linkages between how the human body is understood in these different contexts.

The human body in burial and art: early to middle Neolithic

It is hard to draw a general picture of burial in Iberia for the first millennium or so of the Neolithic. Burials are poorly known in many regions, and such evidence as we possess outlines a highly varied picture (([Martí Oliver 1998](#)). Particularly throughout most of the south and east of Iberia, known burials tend to be in caves, but there are few of them and this may simply underline how little we know of other contexts and ways of disposing of the dead. Only in a few places are larger burial sites known, particularly in southern Portugal, for instance at Caldeirão ([Zilhão 2000](#), 161). Burial rites are equally poorly known and single inhumation was probably the rule, although collective inhumation was practised at Caldeirão and there are suggestions of excarnation in the Andalusian ‘culture of the caves’ at sites such as Carizüela ([Martí Oliver 1998](#), 191). Two main impressions bear mentioning by way of contrast with later periods: burial practice was varied both regionally and temporally, and it rarely took place in formally defined areas dedicated to the dead.

There are occasional anthropomorphic figures on Cardial Ware vessels, and in macro-schematic art. Both genres typically depict stick-figure beings with very elongated bodies, often with arms upraised; no

sexual characteristics are shown. There is little we can say about them except that, if it was not simply assumed that these referred to human beings, they may represent some ambiguous category of semi-humans or cosmological beings. The most famous tradition of Iberian Neolithic art is 'Levantine art' (Fairén-Jiménez, this volume), which is almost unique in European Neolithic art in how it treats the human body; it strongly resembles contemporary north African rock art and may derive from that tradition. Gender in Levantine art is controversial: traditionally figures hunting and fighting were identified as males, and other figures were identified as females, but this has come into question recently. Regardless of which approach is correct, what is really striking about the body in Levantine art is how active it is: it appears running, dancing, hunting, fighting, working, in groups and alone, wearing elaborate clothes and regalia, and (in one famous image) even collecting wild honey (Beltrán Martínez 1982). Stylistically, the body is fleshed out and shown in a wide and fluid variety of positions. If the art selectively represents idealized glimpses of a valued body, Levantine art gives the impression of varied and fluid performance of social moments rather than the rigid, much more stereotyped ways of embodying value found in later prehistoric art.

The human body in burial and art: middle to later Neolithic

From the mid to late fifth millennium BC, there were a number of changes. In the north-east of Iberia, in Catalonia, the 'pit-grave' culture (*sepulcros de fosa*) appears. In many ways, the pit-grave group (which lasted to the mid fourth millennium BC) is an Iberian reflection of similar trends found across southern France and northern Italy in the Chassey-Lagozza tradition. As its name suggests, this group is defined by burials rather than by settlements or artefactual material, which in itself underlines the increasing importance of burial as a social idiom. Pit-grave burials involved single (or, rarely, double) inhumations inside shallow graves, which can be either simple earth pits or involve more elaborate stone linings. They systematically include grave goods, particularly personal ornaments but also plain, dark burnished pottery and axes. The only human representation known to be associated with this culture is the 'Venus of Gava', a hollow pottery female figure about 20cm high which was found inside a mine where the variscite greenstone for personal ornaments was quarried (Bosch Argilagós and Martín 1994). This unique figure includes personal ornaments so popular in the pit-grave tradition—a belt and necklace are shown—but also prominently features the eyes with lines radiating outward from them so typical of anthropomorphic

representations in southern Iberia.

Elsewhere in Iberia, the archaeological record also becomes increasingly defined in terms of burial. From the mid-fifth millennium BC on, burial increasingly takes place in megalithic structures. The development of megaliths in Iberia is contemporary with that of Atlantic France, and involves many of the same structures: menhirs, stone circles, and passage graves. As in Atlantic France, the spread of megaliths in north-western Iberia coincides with the emergence of agricultural economies (Ribé et al. 1997). Variety persists; in Almeria, for example, whilst collective burials are found in caves, there are also small stone cists and circular stone tombs, some of which show evidence of social differentiation (Chapman 2003), and in Andalucia, burials were sometimes made inside subterranean structures or abandoned houses (Chapman 2008). Megaliths appear to have come into use gradually (as far as can be discerned from their often vague chronology) and were earliest in Portugal and north-west Spain, but were widespread by the fourth millennium BC (Del Rincón 1998).

Megaliths were often decorated, both in the Neolithic and in the Copper Age and with both painting and incisions. Megalithic art is found wherever megaliths are known in Iberia. Stones were marked with both geometric motifs and representational motifs; the latter include humans on their own and in hunting scenes, and the overall repertory overlaps with that of schematic art (Sanchidrián 2005; Shee Twohig 1981). Some stones are also decorated in ways suggesting that the stone itself represents a person, much as menhirs are sometimes made into statue-menhirs by adding anthropomorphic decoration; indeed, statue-menhirs may have been incorporated in megaliths and megaliths may have been seen as assemblages of persons in some sense (L. Garcia Sanjuán, pers. comm.). As in Breton megaliths, 'abstract' signs predominate in passages, and larger, more distinct anthropomorphs are sometimes preferentially found in the back of the central chamber, perhaps suggesting an approach to a supernatural presence inside the tomb.

The open-air art tradition of Portugal and western Iberia has a more restricted range of anthropomorphic references, principally including hunting scenes and weapons (which may act as indexes indirectly of persons) (Bradley 1997).

The human body in burial and art: Copper Age

With the Copper Age, from the mid-fourth millennium onwards, burial customs display both continuity and change. Burials continue to be made in two main contexts: megalithic tombs and caves. In general, existing forms of burial are made more formal and elaborate. In

Almeria, for instance, small megalithic cists for collective burials develop into more monumental *tholos* tombs which stood out in the landscape ([Hernando Gonzalo 1997](#)). In Galicia, many monuments were originally sited in visible, landscape-defining places; later ones tend to be smaller and less prominently sited, but now show an increasing architectural definition of separate areas such as chambers and thresholds over time, probably corresponding to increasingly complex ritual practices ([Criado Boado and Fabregás Valcarce 1989](#)). In Portugal and Estremadura, increasingly elaborate tombs combining a tholos (domed chamber) and passage are built ([Oliviera Jorge and Oliviera Jorge 1997](#)), although smaller and simpler burial sites continue to be used ([Lillios et al. 2010](#)). Besides this architectural shift, there are really three relevant social trends. First, burial sites often become larger and include more buried individuals, suggesting that they articulated larger social groups. Second, grave goods sometimes reveal an increasing concern with status. Whilst the abundant grave goods at sites such as Los Millares and La Pijotilla provide the most florid illustration of the use of ritual in defining social class, this is evident to a lesser degree in many other sites. Third, grave goods throughout the peninsula generally conform to a relatively limited range which shows an increasingly stereotypical set of imagery for materializing a social persona: ornaments, weapons, pottery, and occasionally ritual gear. Of these, the first three formed part of a fourth millennium idiom found across Europe; the latter (ritual paraphernalia) tends to be specific to very local regions, suggesting quite locally defined communities of ritual practice.

One feature of the late Neolithic/Copper Age burial record is the increasing visibility of bodily violence. Whilst in part this may be due simply to the larger amount of skeletal material recovered and analysed for this period, there are also a number of sites which either include traumatized individuals or which may be mass burials following a massacre. The best example of these is San Juan Ante Portam Latinam in Cantabria, where at least 338 individuals were buried in a small natural cave, at least some with peri-mortem trauma and/or probable arrow wounds ([Vegas 2007](#)). Whilst violence was obviously known in earlier periods (indeed, some of the most striking images of violence come from battle and ‘execution’ scenes in Levantine rock art), such mass burials may suggest a new social prominence for violence as a bodily practice—one consonant with the increased prominence of weaponry in grave goods and human representations (cf. [Guilaine and Zammit 2005](#) for parallel developments in southern France).

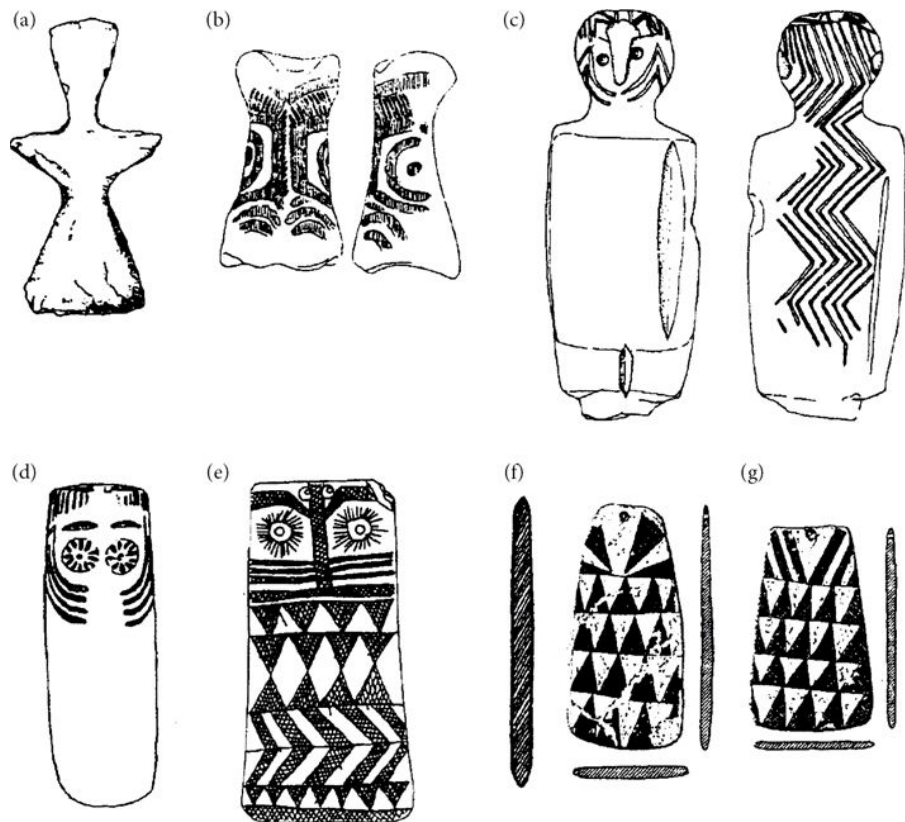


FIG. 50.4. Small anthropomorphic figures from Copper Age Iberia, from varied sites. a. 'cruciform idol'; b. 'phalange idol'; c. ceramic anthropomorph; d. 'eye idol'; e, f, g. 'plaque idols' (modified from [Del Rincón 1998](#), fig. 3.4).

One of the most striking aspects of this period is the great florescence of small, portable human body representations, known as 'idols' in the Spanish literature ([Fig. 50.4](#)). These seem to owe nothing at all to the earlier Mediterranean/Near Eastern figurine tradition, which is earlier and whose westernmost, late exemplar might conceivably be the 'Venus of Gava' in Catalonia. Instead, they seem to represent the development of varied forms of ritual practice using a range of native idioms. 'Plaque idols' were hand-sized flat pieces of slate or schist carved to represent anthropomorphic figures with elaborate dress; they were deposited with burials in Copper Age southern Portugal and Spanish Extremadura ([Lillios 2008](#)). Contemporaneously, in Almeria, animal phalanges were carved into small, highly schematic figurines, and cylindrical stones of all sizes were made into 'eye idols' by adding a pair of eyes. Elsewhere, small human figurines of varied forms were made and deposited in tombs with the dead. On a larger scale, statue-menhirs evolve into more carefully carved statue-stelae which represent ancestors or

cosmological beings; whilst most Iberian statue-stelae date to the Bronze Age, a few demonstrate the Copper Age or late Neolithic roots of this tradition (Bueno Ramirez 1995). There is a clear shift in statue-stelae thematism, with ‘cosmological’ representations, possibly of ancestral figures, in the Copper Age, warrior figures with weapons in the earlier Bronze Age, and more complex ‘narrative’ scenes of warriors in the later Bronze Age and Iron Age (García Sanjuán 1999; García Sanjuán et al. 2006).

Particularly in the late Neolithic and Copper Age, Iberian human body representations demonstrate the strikingly widespread distribution of two distinct sheaves of meanings. One was a complex of gendered symbols centred around hunting, weapons, and males which was widely shared across fourth and third-millennium Europe. The other, specific to Iberia, centred on the image of sometimes elaborately dressed beings whose eyes are surrounded by radiant lines, perhaps indicating spiritual power. It is striking that hunting imagery and material culture appears to be more similar across broad swathes of Europe spanning Iberia and the Alps, whilst death- and power-related imagery takes much more localized forms. This latter set of meanings displays one of the most notable characteristics of Iberian art: whilst elsewhere in Europe forms of representation generally appear as discrete genres, each with its own conventions about how to depict the body, here visual idioms wash together and cross media so that (for example) ways of defining and ornamenting the body turn up on stelae, on megaliths, in schist and slate plaques, and in various forms of figurines. This may suggest that there was a range of general cosmological concepts shared throughout Iberia which were reworked into highly varied local forms of ritual practice.

DISCUSSION

Space does not permit extensive discussion of the archaeological data presented here, but it is worth briefly considering two particular questions: regionality and the body in its various contexts.

Every time we connect the dots to create a picture of prehistory, it requires a model of a social process creating that picture. In this sense, there can be no purely descriptive archaeology. Moreover, scale is important, even if it is often an invisible parameter of our models. For example, we might explain convincingly why people in a single community turned from collective burial in longbarrows to single burial under round barrows by pointing out how this fits into an ideology of local political identities. However, such an explanation is no longer entirely sufficient if we realize that many communities

across a wide swath of Europe made a similar choice at about the same time; at the very least, we need to add a rider specifying some inter-group institution-specific vector of communication about possible customs across an area of this scale, and some reason as to why many of them should have made the same local choice instead of all deciding different things. This has been an important lacuna in many otherwise convincing post-processualist models of social transitions from the adoption of agriculture onwards. Conversely, models which begin with the big picture work best when they can identify a big causal factor to drive broad patterns; it is easy to explain the spread of similar institutions across Europe when one can blame it upon the Roman Empire. When such a factor is lacking, they falter; they tend either to retreat to the level of pure description, to ascribe broad changes to some extra-cultural determinism such as climate change, or (as in 'Indo-European' and 'Beaker Folk' migration models) to promote some process which in fact happens at the local level—social identities, for instance—as a reified large-scale phenomenon, effectively denying agency to the ancient people trapped within their models.

This issue is not coincidental but fundamental to Europe between 6000 and 2000 BC, for it is above all a period characterized by the paradox of archaeologically visible broad-scale changes which happen in a completely decentralized social landscape. We have, as it were, Big Changes, and only Little Causes are available to explain them by. Without lengthy discussion, the best approach here it to look at prehistory as multi-scalar, as an intersection of histories unfolding at different scales. If people work within an inherited cultural repertory of possible thoughts and actions, then this repertory itself can have a history and geography; by virtue of the fact that people and communities do not invent their culture *ab novo* with each social act, a cultural repertory can be seen historically as more than simply the sum of its component acts of local making. A similar argument can be used to understand traditions as agents ([Robb 2008](#)). Individual creative acts will thus both be contingent upon these large-scale histories and able to redirect them.

Figurines have to be seen as part of a regional Neolithic cultural repertory spanning the Balkans, the eastern Mediterranean and the Near East; Italy, Malta, and Sardinia lie upon its western margin. Making and using small clay representations of the human body, particularly females, appears to have been transmitted as part of a bundle of institutions at the beginnings of the Neolithic in the area; it probably included specification of actual practices in which figurines were used. However, these ideas and practices were continually subject to ongoing, highly local reinterpretation, which resulted not

only in the highly varied forms of figurines but probably in their actual uses as well (for instance, the generally unparalleled inclusion of figurines in burials in middle Neolithic Sardinia) (Robb 2008). Moreover, these now local histories intersected later ones. During the later fourth and earlier third millennia, small female figurines generally went out of use on the mainland, but remained in use in many places along the southern edge of Europe (Cyprus, the Aegean, Malta, Sardinia, even perhaps south-eastern Iberia). In these places, however, they tended to become larger, to shift from clay to stone (particularly white marble), and to be used particularly in contexts associated with death. All of these three changes are part of the general transition in how human bodies were used across much of Europe; rather than linking the islands as evidence of some westward influence radiating from the Aegean, as Mediterranean prehistorians often do, it makes more sense to consider them as parallel local developments in which a similar but not identical Neolithic heritage was reformulated locally using selected ideas available as part of a new regional repertory, for instance the linkage between death and the materiality of stone. We can make similar arguments for other genres of human body representation, for instance the parallels between hunting art at Porto Badisco, Italy, and in the Spanish Levant. Indeed, such a multi-scalar interpretation is necessary if we are to explain not only why statue-stelae appear in many places of Europe at roughly the same time, but why they were *not* made in some areas, why all the traditions differ, and why some (such as Valcamonica) are completely divergent.

This leads to burial. In the most general sense, burial in the central Mediterranean in the sixth millennium BC tends to be relatively simple; the fifth millennium is marked by more experimentation with elements such as rite, grave goods, architecture, further use of skeletal material, and location. This develops into increasingly formalized burial sites particularly from the mid-fourth millennium onwards. In Sardinia, Corsica and some areas of the Alps this intersected the area of western and central Europe in which megaliths were a cultural option, but elsewhere it is expressed by cemeteries of underground collective tombs, cemeteries of individual graves, or burial in funerary caves. Thus, although it has been traditional in British and Scandinavian archaeology to associate the construction of megalithic monuments with the onset of the Neolithic, it is more accurate to contextualize this at a greater scale and within historical time. The fourth millennium BC was characterized by a general monumentalization of the landscape which happens across Europe both in societies which were going Neolithic at the time and in societies which had already been Neolithic for up to two millennia.

Effectively, one cultural repertory was slowly replacing another across the continent. Yet the great variety in ways this happened on the ground suggests that what was shared was relatively abstract possibilities for meaningful practices; exactly what these meant, and how to enact them (if at all) were worked out through local practice.

Finally, what do we gain by looking at burials and human representations together? Both are social representations of the body, and they provide a lens upon the body's role in social reproduction. Yet they refer to the treatment of the body in different contexts which may not overlap. In the earlier part of the Neolithic, figurines probably refer to particular ritual contexts; inasmuch as they referenced understandings of the body relevant to other contexts, these involved gender, which is little differentiated in burials. But the two foci of human representations and burials converge in the fourth to third millennia, drawn into a complex of mutually reinforcing ideas and practices. Constructing burial sites, whether megalithic or not, was one of the principal ways in which humans established a long-term, monumental presence in the landscape. It would have integrated ideas about the human body as a means of relating people (for instance via kinship links) and as a substance (for instance through homologies of bone as ancestral substance and stone as an enduring medium); these in turn would also have been involved in the logic of new genres of human representations such as the development of menhirs into statue-stelae; the latter probably represented ancestral figures and, when not actually placed in a funerary context, were used to mark historical landscapes in similar ways to monuments. A final convergence between burial and images of the body happened when the two contexts are used to present a similar idea of the human body through divisions of the body and material culture such as weaponry and ornaments. The emergence of a clear ideal of the body relevant across contexts, as well as within them, marks a new mode of political interaction, particularly focusing upon exchange and display (Robb 2007). As such, if these changes were relevant to self-presentation in contexts of inter-group contact, this may provide a reason why they might have spread rapidly from one group to another in a world without large-scale institutions.

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responsibility.

Note

1. All dates in this chapter are given in calibrated radiocarbon years.

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CHAPTER 51

MORTUARY PRACTICES, BODIES, AND PERSONS IN CENTRAL EUROPE

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PERSONS, BODIES, AND MORTUARY ARCHAEOLOGY¹

THE discussion over personhood is now well established in Anglophone archaeology. It originates from the critique of the modern Western notion of the ‘individual’ as an indivisible and essential entity free to enter into relationships (Fowler 2004; Thomas 2004). In contrast, ethnographic evidence indicates that, although there are single, self-aware human persons the world over, they see themselves as variously constituted by their social relationships, which can involve other living humans, animals, objects, ancestors, or spirit beings (Fowler 2004; Jones 2005). Archaeologists are far from reaching a consensus on the direction this debate should take, or on terminology (see Knapp and van Dommelen 2008). Here, ‘individual’ denotes single human beings, for instance skeletons in graves, whilst ‘person’ refers to how people believed themselves to be constituted, i.e. to their model of personhood.

Archaeological discussion has often drawn on ethnographic studies for inspiration. Perhaps most famous is Strathern’s (1988) work on Melanesia and the ‘dividual’, a person whose every aspect is the product of relationships with others (cf. Fowler 2004). However, we should avoid simply creating over-generalized concepts of either ‘Western’ or ‘non-Western’ personhood if we want to grapple with the existing variety and complexities (Fisher and Di Paolo Loren 2003; Morris 1991; Jones 2005). Thus, LiPuma (1998) argues for a continuum between individualizing and relational conceptions of the self. Dominant modes of personhood are variously positioned between these two poles, but to some degree aspects of both co-exist. Many ethnographic and archaeological case studies now illustrate this (cf. Brück 2006; Busby 1997; Chapman 2000; Fowler 2004; Viveiros de Castro 1998).

An emerging key point is the role of daily practice in constituting

people's selves (Barrett 2001; Ingold 2000, 18–21; Knapp and van Dommelen 2008; Whittle 2003). It is coupled with a renewed archaeological interest in the body and embodiment, following a similar trend in anthropology (Csordas 1990, 1999; Featherstone et al. 1991; Lambek and Strathern 1998). 'The body' as a theoretical concern combines the investigation of unreflected routines and daily practice; dress, posture, and gesture; gender, age, and other aspects of identity; human representations such as figures; osteoarchaeology and palaeopathology; and mortuary studies, to name the most salient (e.g. Borić and Robb 2008; Hamilakis et al. 2002; Meskell and Joyce 2003; Sofaer 2006). Personhood, too, is included in studying how embodied persons experience and act within the world (Fowler 2004).

Evidently, then, a full discussion of personhood and the body cannot rely solely on burials, and several authors have attempted to combine multiple strands of evidence (e.g. Hofmann and Whittle 2008; Jones 2005; Meskell and Joyce 2003; Wengrow 2006). In the context of this volume, we do focus on the contribution of burial practices to an investigation of bodies and persons, but we strongly recommend referring to other chapters for broader insight into a particular case study.

Although discussions of personhood and the body have become increasingly nuanced, it often remains unclear how notions of personhood impact on the treatment of the deceased. Burying a whole body does not necessarily imply a greater focus on Western-style individuals than collective burial, cremation, or fragmentation, and the latter may co-exist with individualizing conceptions of personhood (see Fowler 2004, 83–92). In the Neolithic, burial practices are often diverse, involving the inhumation of single individuals alongside the fragmentation of bodies. At other times, only some of these strands are elaborated, and indeed the amount of known burials varies from hundreds to just a handful. Funerary rites hence differed not only in nature, but also in the degree to which they formed a focus for social expression.

This paper discusses the funerary practices of the Linearbandkeramik culture (LBK, c. 5500–4950 BC) in the central and western European areas of its distribution, and some of its middle Neolithic successor groupings, especially in Germany (c. 5000–4200 BC). We conclude with mortuary rites in the Michelsberg culture and contemporary groups (c. 4200–3500 BC) and an outlook on late Neolithic practices in the Mittelelbe–Saale region.

IMAGE AND PROCESS: LBK AND POST-LBK FUNERARY RITES

Whole bodies

Early Neolithic burial practices are varied, including burial in cemeteries and settlements, partial, and secondary burial. From the Mesolithic onwards, single, double, and multiple burials in isolated graves or cemeteries, with variable body positions and grave good assemblages, exist alongside secondary burial and cremation (Grünberg 2000; Meiklejohn 2009). Isolated human remains from occupation sites may also be traces of burial rites. Occasionally, human bones show traces of manipulation, such as cut marks, a certain perimortal breakage pattern, and signs of burning, variously interpreted as evidence for cannibalism or special burial rituals (Orschiedt 1999; Boulestin 1999; Andrews and Fernandez-Jalvo 2003). Therefore, the diversity in LBK mortuary rites may have a long ancestry, although given the continuing debate on the LBK's origins, in spite of new genetic data (cf. Gronenborn 2007; Gronenborn and Dolukhanov, [this volume](#); Brandt et al. 2013), the precise trajectory of different treatments needs detailed investigation. Indeed, the currency of different practices varies over time.

For instance, despite intensive earliest LBK (c. 5500–5300 BC) settlement activity, few cemeteries of this ceramic phase are known, and where dated, they seem to fall near its end (see e.g. Vedrovice, Pettitt, and Hedges 2008; Kleinhadersdorf, Neugebauer-Maresch, and Lenneis 2013, 306; and perhaps Wallmersbach and Nadler 2011). Generally, people are interred as isolated settlement burials, sometimes with grave goods, buried in specially dug grave pits or other settlement features (Orschiedt 1998; Gronenborn 2003; Veit 1993). More cemeteries appear in the Flomborn period (from about 5300 BC), but most sites begin in the later or latest LBK (from c. 5200 BC) and, with few exceptions (e.g. Aiterhofen, Lower Bavaria; Wittmar, Lower Saxony), go out of use before its end (Nieszery 1995, 32–34; Rötting 1983; Whittle 1996). Also, cemetery sites cluster in only some regions and can contain anything from barely over ten to over two hundred interments (cf. Jeunesse 1997). Hence, the dead of one or several family or even settlement groupings could be buried on such sites, but given the overall numerical discrepancy between burials and settlements, this was only a selection of any community's dead (van de Velde 1979). Although the majority of LBK individuals excavated are indeed from cemeteries, they form a partial record.

The reason for the dominance of cemeteries in social models for the LBK is perhaps due to their familiarity for modern observers (Friedrich 2003). Cemetery burials, to our eyes, provide an intuitively understandable picture of a neatly laid-out individual body, often surrounded by grave goods. This makes it easy to ascribe static and

normative identities and create an impression of orderliness and familiarity, including the implicit assumption that LBK persons thought of themselves as ‘individuals’, much like we do today. Indeed, cemetery burials tend to conform to a number of rules, although the consistency with which these are applied differs considerably between sites.

Generally, the dead were buried in a crouched position on their left side, head pointing east, although all sites yield an often substantial number of exceptions. For grave goods, much has been made of sex- and, to a lesser extent, age-related differences, especially of the fact that male graves tend to contain more, and more varied, items (cf. [Jeunesse 1997](#)). Goods include flint and polished stone tools (mostly for men), pottery, and bone or antler objects, generally placed around the upper body. Personal adornments include *Spondylus* buckles, armrings, and beads (see [Chapman and Gaydarska](#), this volume), Atlantic or riverine shells, bone combs, and animal teeth, again mostly decorating the upper body and head. Preferred ornaments vary regionally, with Atlantic shells, for instance, most common in the Paris Basin and Alsace, and bone combs restricted to Bavaria and Austria.

The creation and maintenance of LBK identities can hence be discussed at different scales, from individual, age, or gender to regional or culture-wide markers (e.g. also [Hedges et al. 2013](#)). For instance, *Spondylus* artefacts in certain styles, worn at clearly defined locations on the body, helped to create a standardized, ideal picture of a beautifully adorned body recognizable and appreciated throughout the LBK ([Fig. 51.1](#)). How *Spondylus* was treated at the grave side, whether left whole, as in most cases, or broken and scattered within the grave, as on some eastern French sites ([Jeunesse 2003](#), 29), evidences the integration of this LBK-wide ornament into regional practices. *Spondylus* can also be seen as marking a particular social group. In the case of armrings, these are generally males of various ages, sometimes buried with standardized assemblages (as at Aiterhofen). At least at some sites, women are more likely to receive *Spondylus* goods when older and frequently combine them more idiosyncratically with ornaments in other materials ([Hofmann 2009](#)).



FIG. 51.1. Grave 41 (12-year-old child) at Aiterhofen, Lower Bavaria. Note the *Spondylus* armring and beads and the collection of stone tools. Reproduced with kind permission of the Bayerisches Landesamt für Denkmalpflege, Regensburg.

Many studies essentially focus on discussing such idealized or stereotypical identities and how they are signalled through grave goods. Traditional lines of interpretation correlate the presence/absence of goods, or certain body orientations, with statically defined identities, especially socio-economic status and, more recently, 'local' or 'incomer' (e.g. [Jeunesse 1997](#); [Nieszery 1995](#); [Bentley et al. 2008](#)). The presentation of the body in death is used to argue for neatly bounded social categories. Indeed, architectural evidence (see [Last, Coudart](#) this volume) could be cited in support. LBK houses, with their profusion of posts, create an almost over-structured context in which bodies could be controlled and classified rigorously according to who was allowed to stand, sit, or move where and in what manner, thus grouping persons into a set of 'ideal' identities.

The situation is, however, more complex. To begin with, even the identities displayed in cemeteries were constructed over a lifetime. For instance, comparing the diameters of *Spondylus* armrings for children and adults suggests that smaller rings were put on in early childhood and could not be removed. Probably during initiation rites, they were broken and replaced with adult-sized ones, again an essentially permanent ornament ([Nieszery 1995](#), 185f). Here, the growth of the body, a biologically continuous process, is culturally segmented through bestowing exotic rings as gifts, creating ties and obligations within and beyond communities. These rings were fixed, integral markers of an identity partly embodied through the felt tightening of the rings as muscles grew, but also defined by links with others.

Identities and bodies are hence fluid throughout a lifetime and multiply authored, depending for instance on gifts and ceremonies sponsored by others, and on more routine interactions such as labour or food sharing, partly choreographed through architecture. These connections were stressed at the graveside through breaking and removing parts of objects, or through prolonged ritual interaction after burial (see [Hofmann 2009](#)).

Throughout the Neolithic, whole bodies are also interred in settlements. Often, women and children, sometimes under-represented in cemeteries, are treated in this way ([Orschiedt 1998](#); [Veit 1996](#)). Since in the LBK, many settlement burials are unfurnished, they are often interpreted as low-status individuals. However, it would be an unusual choice to keep unwanted dead close by, and the regular body positions parallel those observed on cemeteries. In addition, in some LBK phases and regions, all known burials come from settlements. It is hence equally possible that continued proximity to the living was desired. In such an interpretation, the final presentation of the body took place in a less formal context than a cemetery burial. The deceased being well-known to the mourners meant less need for signalling stereotypical identities through grave goods. Yet ultimately, the precise motives for choosing cemetery or settlement burial remain unclear.

Dissolution and fragmentation

Alongside the deposition of whole bodies, alternative practices in cemeteries and elsewhere focus on the dissolution of the body, its mixing with other bodies and objects, and the constant engagement of the living with the remains of the dead. It is sometimes suggested that cremations in cemeteries comprise more than one individual (e.g. [Nieszery 1995](#), 297–304; but see [Trautmann 2007](#), 160); in any case, burnt human bone is intermingled with the burnt remains of objects ([Trautmann 2007](#)). But even inhumed individuals have occasionally been manipulated after burial. This can range from moving skeletal elements, such as the skull or an entire arm, to the secondary deposition of isolated bones on several levels within the grave fill (e.g. Sondershausen 13, Thuringia; Ensisheim 2, Alsace; Vaihingen 63, Baden-Württemberg; cf. [Jeunesse 1997](#), 67–70). At the late LBK Jungfernhöhle cave in northern Bavaria, the fragmented remains of at least 41 individuals, mostly women and children, were tossed into the cave shaft with fragmented objects and animal bone ([Orschiedt 1999](#), 164–178). Unfortunately, the quality of excavation makes it hard to estimate the duration of this episode, and interpretations of both cannibalism and secondary burial rites here have been challenged

(Orschiedt 1999; Seregély 2012). Secondary burial is, however, attested on some settlements, such as Wiesbaden-Erbenheim (Hesse), where the fragmented remains of nine adults and children were placed in a loam pit alongside a house associated with an admixture of pottery from the earliest to the late LBK. Signs of manipulation are lacking (Orschiedt 1999, 158–163).

The exceptional finds from the latest LBK pit enclosure at Herxheim, Rhineland-Palatinate, offer another insight into this kind of practice (Orschiedt and Haidle 2007, 2009, 2012; Zeeb-Lanz 2009, 2013; Zeeb-Lanz et al. 2009). Repeatedly recut enclosure segments contained human remains in conjunction with animal bone, stone and flint tools, and ceramics. The skeletal material was often extremely fragmented. Skulls especially seem to have been worked in a regular fashion: the sides, face, and back of the head are removed to leave the flat skull cap (Fig. 51.2). Probably depending on the state of decomposition, soft tissue, especially the scalp, was occasionally removed. Interpretations so far suggest a complex, multi-phase mortuary ritual at the very end of the LBK, a time when funerary practices more frequently focus on dissolution and on combining fragmented human and animal bodies and other objects (see most recently Boulestin et al. 2009; Orschiedt and Haidle 2012).

(a)





FIG. 51.2. (a) Complex 9 from the pit enclosure at Herxheim, Rhineland-Palatinate. Reproduced with kind permission of Andrea Zeeb-Lanz, Generaldirektion Kulturelles Erbe Rheinland-Pfalz, Direktion Archäologie Speyer.

(Photograph: J. Orschiedt).

Similar concerns are mirrored in the making and treatment of anthropomorphic figurines, a relatively rare but consistently recovered find in the western LBK. Originally interpreted as ‘mother-goddesses’ (but see [Hansen 2001](#); [Becker 2011](#)), these figures often show a mixture of human and animal traits. Some are tempered with flour or treated with birch tar or ochre—this treatment interestingly again often focusing on the head—and all seem intentionally fragmented, stressing the theme of bodies as unstable mixtures of various substances ([Hansen 2005](#); [Höckmann 2001](#); [Hofmann 2005, 2007](#); [Hofmann and Whittle 2008](#)).

In the LBK, then, at least two aspects of the body exist in tension. On the one hand, the body could be presented whole, although this was also the outcome of a process in which a person was constituted through relationships such as exchange and food sharing. Yet the wearing of shell rings, or burial within a spatial or orientation grouping in a cemetery, stressed selected aspects of that identity, often corresponding to regional or culture-wide expectations in choice of goods or adornment of specific body parts. Relationality was differently expressed in the deliberate dissolution of the body. This

idea of the body as malleable and unstable is expressed in the moulding and breaking of figurines, or in cremation and secondary burial. Here, fixing a body or an identity permanently is eschewed, stressing the social process of their creation and transformation, which could continue for a varying length of time after death.

Some, however, were excluded from any funerary rite. The 34 individuals from a late LBK mass grave at Talheim, south-west Germany, are the best-known example. They were killed by adze blows to the head and dumped haphazardly into a large pit (Wahl and König 1987). At Asparn, Austria, the remains of over 100 people, many showing injuries, were scattered in the settlement's surrounding ditch and lay unburied for some time (Teschler-Nicola et al. 1996). At Wiederstedt, Saxony-Anhalt, the remains of ten mostly 7- to 15-year-olds were tightly squeezed into a pit. As they lack traumatic injuries, they are interpreted as the victims of disease (Meyer et al. 2004). These practices are best seen in the light of a 'bad death', the exclusion of some individuals from established funerary rites due to the manner of their demise. All other identities the deceased may have held are suppressed, whilst the irregular body positions and lack of engagement with the remains are perhaps an expression of horror in the face of catastrophic circumstances, or indeed disregard by the perpetrators of violence. Here, the conventional strategies of mourning and burial were insufficient; these bodies were simply abandoned.

After the LBK

The tension between the presentation of a whole body and its dissolution runs through many successor cultures of the LBK (often grouped as 'middle Neolithic'), which in central Europe continue for roughly another half-millennium. In spite of changes in material culture, such as houses and pottery, there is no clear hiatus in mortuary ritual. Cemeteries with inhumations and cremations still exist, but are now rather rare, and there is a trend to bury the deceased in smaller groups. Nevertheless, some more extensive sites have been excavated; the most well-known are the Hinkelstein/Großgartach cemeteries at Trebur, Hesse (Spatz 1999), Lingolsheim and Erstein, Alsace (Lichardus-Itten 1980), Rheingewann and Rheindürkheim near Worms (Koehl 1903), the Rössen culture cemeteries at Rössen in Saxony-Anhalt (Niquet 1938), and Jechtingen in Baden-Württemberg (Dehn 1975; Dornheim 2011).

Trebur is one of the few completely dug Neolithic cemeteries, totalling 137 inhumations. Two ceramic culture groupings, Hinkelstein and Großgartach, used it concurrently for several

generations, but buried their dead in distinct areas (Spatz 1999; Müller 2002). The most lavish graves lie close to the border between these two groups, which has been read as competition between communities (Müller 2002). In such a model, the single body is used to reflect the concerns of the wider body politic. Indeed, there is also a new willingness to make full use of the body's opportunities for display. Individuals are buried supine, with limestone and animal tooth ornaments all over the body, not just around its upper half (Spatz 1999; Hofmann and Whittle 2008). In addition to ornaments and goods, such as various tools and pottery, animal parts were frequently deposited as food offerings, most strikingly whole sides of beef in some male graves (Fig. 51.3). This may well have included feasting at the grave side, perhaps to consume the remainder of the animal, but direct evidence is lacking. Although these changes still need to be fully contextualized, it is tempting to draw a connection between new ornament conventions and new arenas for display, such as large roundel enclosures, where mass gatherings likely took place (see Petrasch, this volume). Compared to the LBK, domestic architecture also opens up, creating greater opportunities for displaying ornamented bodies.

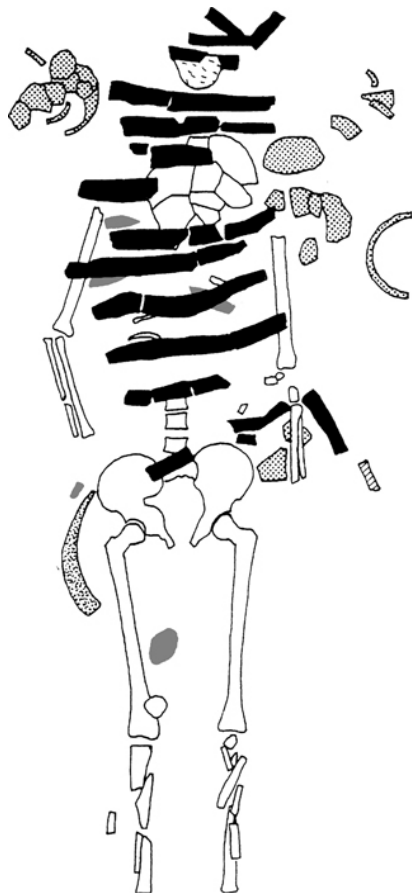


FIG. 51.3. Burial 70 (adult male) at Trebur, Hesse. Cow ribs, shown in black, cover the upper body.

(After [Spatz and von den Driesch 2001](#), fig. 1; drawing by I. Dennis).

Again, cemetery burial may be the most researched practice, but it is not the only one. Given the period of Trebur's use (c. 4900–4500 BC), the number of interments is actually rather low, and alternatives to cemetery burial existed. As for the LBK, these comprise settlement burials and secondary treatment of fragmented remains ([Veit 1996](#)). Views on the constitution and dissolution of bodies and persons were hence again contradictory and complex.

THE LATE NEOLITHIC: PARTS OF BODIES, MIXED BODIES, AND NO BODIES AT ALL

In succeeding phases, emphasis shifts towards practices stressing dissolution. Evidence for mortuary rites is rare, making it difficult to

comment on the funerary practices of many regions and cultures. Apart from a tight cluster of cist cemeteries in western Switzerland, there are very few burials from the northern Alpine lake village horizon (e.g. [Moinat and Chambon 2007](#); [Nickel 1997](#), 127f). Mostly, human remains occur as isolated bones on settlements. It is tempting to see this as part of a set of values in which largely homogeneous architecture and material culture emphasized village-wide identity at the expense of displays of individual status, but there is likely to be variation (see [Menotti](#), this volume).

Funerary evidence is most numerous for the widespread Michelsberg culture (c. 4200–3500 BC) of central and western Germany and eastern France. There are no cemeteries, but isolated human remains from enclosures and settlement pits, often found with artefacts and occasionally showing cut marks, perimortal breakage patterns, and some signs of burning ([Fig. 51.4](#)). The few complete single and multiple burials, some neatly crouched, others seemingly dumped, tend to come from the base of pits or ditch segments ([Nickel 1997](#)). There are generally no grave goods, but the 60-year-old woman buried crouched in a pit below the base of a ditch segment at Bruchsal Aue (grave 3), for instance, received aurochs horn cores ([Nickel 1997](#), 100). The recently excavated site at Beaurieux in the Aisne valley ([Manolakakis et al. 2007](#)), with its furnished burials under monumental mounds, is an interesting exception.



FIG. 51.4. An assemblage with human remains from the Hetzenberg, Baden-Württemberg. Reproduced with kind permission of Regierungspräsidium Stuttgart, Landesamt für Denkmalpflege.

Skulls, sometimes found in concentrations, dominate among the isolated human bones from enclosures. They were deposited after soft tissue had decayed, as the mandible is generally absent (Nickel 1997). The skull from the Ilsfeld enclosure, Baden-Württemberg, is an exception. This individual was killed by two blows to the right side of the head, but there is also a hole in the centre of the cranial vault, caused by a pointed object piercing the skull from the interior. These defects, the damage on the cranial base, and weathering patterns are consistent with display on a pole or post, perhaps as a trophy head near the gate (Wahl 2007, 169–171). There are other examples for skull trauma due to violence, generally on complete skeletons, such as the adult woman from a settlement pit at Rosheim ‘Saint Odile’, Alsace (Nickel 1997, 161). In a pit at Heidelberg-Handschuhsheim, three adults (two men and a woman), a juvenile, a newborn, and an older child were buried in a crouched position. All three adults and the juvenile were killed by blows to the head (Wahl and Höhn 1988). Apart from the juvenile’s animal tooth necklace, there were again no grave goods—the ceramics in the pit were wasters from firing (Behrends 1998).

In total, there are c. 350 Michelsberg culture individuals over 800 years and a considerable geographical extent. These are hence not representative and often interpreted as special burials (Nickel 1997, 131f). The picture is similar for other, partly contemporary culture groups. Thus, the south-east German Münchshöfen culture yields multiple and partial burials in settlement pits, often without grave goods, alongside single furnished inhumations in own graves (Veit 1996; Meixner 2009). In some instances, the burials of animals parallel the treatment of the human dead, and both could have been used to symbolically demarcate the limits of the community (Hofmann 2007). From the succeeding Altheim culture, all known skeletal remains come from the eponymous earthwork and may have been victims of a violent conflict (Nickel 1997, 126). For the south-west German Aichbühl culture, the only possible funerary site is the Hohlenstein-Stadel cave. Here, the extremely fragmented skulls and long bones of at least 30 individuals were deposited near the cave entrance in a shallow scoop partially ringed with stones (Orschiedt 1999, 179–188).

Generally then, the majority burial rite of many late Neolithic groups has left no archaeologically recognizable traces. As for the early and middle Neolithic, available evidence shows no rigid idea of an exclusively employed funerary rite, but an emphasis on diversity at the level of the individual corpse. The reasons for this have hardly been studied, but could include ritual factors, specific characteristics of the person, or the circumstances of death. Overall, bodies are not

categorized through ornaments and grave goods, as many early and middle Neolithic individuals were, but through the rite itself. The burials we observe have less to do with the repetition of accepted acts and more with a memorable ceremony, often carried out in eminently public places such as enclosures. It can be suggested that human bodies were used alongside animals and objects as part of wider statements concerned with defining the community and its boundaries. This is consistent with the burial of victims of violence and the frequent selection of boundary ditches, although it may not explain all instances. These individuals were denied the perhaps more time-consuming but archaeologically invisible rites probably employed for the majority, and were instead used in an almost theatrical way.

Case study: funerary diversity in the Mittelbe-Saale area

Owing to the increasing number of regional late and final Neolithic groupings, we have chosen to limit discussion of the post-Michelsberg horizon to the archaeologically rich Mittelbe-Saale area in central eastern Germany. Here, the Baalberge culture (c. 3800–3400 BC), in contrast to Michelsberg, is characterized by the increasing elaboration of generally single interments, either through grave goods, or through architectural features such as cists or mounds ([Müller 2001](#), 313–320). But from about 3400 BC onwards, collective burials increasingly dominate. For [Müller \(2001, 384\)](#), the main distinction is the shift of attention away from a specific buried individual and towards the ritual activities of the survivors, a trend visible in contexts as diverse as settlement burials, collective megalithic graves, or single burials under mounds and in cists. Interestingly, the many ceramic culture groups in existence, such as Salzmünde, Walternienburg, and Bernburg, do not correlate with a specific funerary custom, but use several concurrently, drawing on a shared range of practices.

For instance, at the eponymous enclosure of Salzmünde, more than 50 skulls, already decomposed at the time of deposition, were placed in the two parallel ditches, singly or in groups, alongside human and animal skeletons in varying states of completeness, and isolated bones. Human remains were recovered from storage pits, including stacks of more or less incomplete skeletons, torsi in irregular positions, and isolated skulls. Most remains were interpreted as secondary burials. However, there are also some primary interments containing grave goods, such as large flint blades, loom weights, and spindle whorls. Other individual and collective burials were laid on a tightly packed scatter of intentionally smashed pottery and sometimes surrounded by sherds ([Schlenker and Stecher 2013](#)).

In contrast, the 64 individuals in the monumental, plank-built collective grave at Schönstedt with its 9m by 4m chamber, were arranged in small groups with few, but group-specific, grave goods. More pottery was smashed in the entrance of the structure. Often in graves of this type, skeletons witness a greater degree of disarticulation and mixing, and the wooden elements of the chamber were sometimes intentionally set on fire, charring or cremating the remains within. At the Bernburg cemetery of Pevestorf 19, there was still a much greater focus on elaborating individual graves through goods and above-ground marking by posts. Nevertheless, there were also areas with smashed pottery and traces of burning, interpreted as rituals for the buried collectivity as a whole (Müller 2001, 384).

As for the LBK, there are hence several recurrent elements, in this case including the destruction of wealth at the grave side; grave goods for an individual; architectural elaboration; single, multiple, and/or partial interments; the use of fire; and the grouping of related graves—but these are selectively recombined at each site (Müller 2001, 385). Whilst the specific character of these elements and practices creates a recognizable ‘late Neolithic’ style, some concerns, such as the fragmentation of bodies and the co-existence of several rites, are by now a feature of great antiquity.

CONCLUSION

This chapter has shown that throughout the central European Neolithic, varied burial practices existed concurrently. These cannot be adequately subsumed by models privileging one kind of evidence, for instance cemetery burial, as ‘normative’ and marginalizing others. The fragmentation, even destruction, of bodies, which seems counterintuitive to us today, often played a central part in Neolithic mortuary rites. In this context, thinking through personhood and the body is fruitful, as it ultimately leads to combining multiple strands of evidence. For instance, both in the early and in the late Neolithic, the burial of whole bodies and the fragmentation of individuals co-existed at certain times and places. These rites took place against a background of radical differences in domestic architecture (longhouses versus small, single-family dwellings), body representations (clay figurines present/absent), changes in technology and social networks (partly related to the introduction of copper: see Roberts and Friedman, this volume), and so on. Thus, whilst long-term trends in preferred rites can be suggested, the challenge is to examine whether any similarities are the result of essentially similar conceptions of personhood and the body or whether more contextual interpretations

are also possible.

It is unlikely that superficially similar rites, such as ‘fragmentation’ or ‘settlement burial’, retained the same meaning and importance over several millennia and in the face of changes in other domains of life. In addition, the archaeological visibility of and social emphasis on mortuary rites fluctuate. The wider implications of these patterns can only be appreciated by linking mortuary rites with other evidence. How does the archaeological visibility of individual bodies, for instance, relate to the monumentalization of domestic architecture or public spaces? Can changes in daily routines be correlated with preferences in body treatment, or the prominence of animals and objects in various mortuary rites? And what were the emotional and political implications of choosing between available alternatives?

We are still far from realizing the full potential of body and personhood studies, and an overview of this kind perhaps raises more questions than it answers. What is evident, however, is that these themes offer the opportunity to reinvigorate the study of burial practices, to make creative use of the full range of evidence, and to take it beyond the narrow concepts of status and prestige which often dominate it.

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NOTE

1. This text was written in June 2009; later literature has been quoted where relevant, but could not be fully integrated into the argument.

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CHAPTER 52

MORTUARY PRACTICES, BODIES, AND PERSONS IN NORTHERN EUROPE

KARL-GÖRAN SJÖGREN

INTRODUCTION

THIS chapter provides a brief overview of practices involving human remains during the period c. 4000–2200 BC in northern Europe, with an emphasis on southern Scandinavia, that is, Denmark and southern Sweden. There are two main reasons for this limited focus. First, most of northern Europe is made up of primary, crystalline rocks, such as granites or gneisses, where preservation of unburnt human bone is generally poor. Only in limited regions do sedimentary rocks like limestone, chalk, and slate occur. The most important of these areas are the Baltic islands of Öland and Gotland, parts of Skåne in southern Sweden, and the inland area of Falbygden in western Sweden. In these areas, preservation is generally good. The recognition in recent years of cremation as a common form of burial opens up new possibilities, however. Second, archaeological activity has been uneven, so that knowledge about the treatment of human remains is mostly concentrated in Denmark, where preservation is variable but generally less favourable than the limestone regions, and the southern parts of the Scandinavian Peninsula.

Finds of human bones come from a number of different contexts, such as monumental and earthen graves, mortuary houses, bog finds, causewayed camps, and settlements. Some of these remains may be the product of specific stages in extended mortuary processes, whilst others probably result from different kinds of practices. The interpretation of megalithic tombs as ossuaries is reviewed critically, and an alternative interpretation, primary burial with subsequent handling of selected bones, is preferred. Recent evidence from eastern Sweden, indicating more complex mortuary practices than usually envisaged for the middle Neolithic in this area, is discussed briefly. This includes the practice of cremation, indications of secondary burial, and the discovery of probable mortuary houses.

In comparison to some other European regions, representations of the human body are a rare occurrence in the Neolithic of southern Scandinavia. Most of the pottery decoration is abstract, geometric, and non-representational. For the Funnel Beaker cultural complex (TRB), only some pots from megalithic tombs showing human faces in a rather sketchy form can be mentioned. Figurines of clay, bone, or stone occur mainly on Pitted Ware culture (PWC) settlements, often showing animals such as bears, seals, etc., but in a few cases showing simple human forms ([Wyszomirska 1984](#)). Rock art from the area is mainly from the Bronze Age, although some of the cup marks often found on the roof blocks of megaliths may be Neolithic. Rock art from the Stone Age does indeed often show humans, but has so far only been found in more northerly parts of Scandinavia, and in a very different cultural and economic context. Since these sources are rather uninformative, representative art is not discussed further here.

The Neolithic of Scandinavia is divided into the early (4000–3300 BC), middle (3300–2200 BC) and late Neolithic (2200–1800 BC) periods. The early Neolithic is further divided into the EN I (4000–3500) and EN II (3500–3300) periods, and the middle Neolithic into MN A (3300–2800) and MN B (2800–2200). The beginning of the Neolithic is defined by the introduction of domesticated species and of the Funnel Beaker (TRB) cultural complex. At the same time, or possibly a little bit later, we find the first indications of monument construction in the form of long barrows. Towards the end of the EN, the first megalithic chambers were built, in the form of small dolmens, but the majority of dolmens and passage graves were erected in a short period in the beginning of the MN A. At more or less the same time, a new cultural complex started to evolve in eastern Sweden, the PWC. In contrast to the TRB, people belonging to this complex seem mainly to have subsisted on hunting and fishing, at least in this eastern area. During the MN, the PWC gradually spread over Scandinavia and replaced the TRB in Sweden, and is even found in parts of Denmark. The MN B is marked by the end of the TRB in Denmark and south Sweden, and the occurrence of the Single Grave culture in Denmark and the Battle Axe culture (BAC) in Sweden. These were contemporary with the PWC in many regions, leading to a complicated situation which is not very well understood. The interpretations of these complexes have varied widely. Common suggestions view them as different ethnic groups with differing economic specializations, or as immigrant populations. Explanations where they are seen as expressing different aspects of one and the same society have also been proposed. The issues are further complicated by dating problems and by regionally varying developments.

CONTEXTS FOR HUMAN BONES

It is important to realize that human remains are found in a number of different contexts, some of which may be characterized as ‘mortuary’, whilst others are perhaps of a different character. It is at present a matter of debate to what extent these contexts represent different stages in a sequence of mortuary rituals or different practices altogether. Briefly, we may distinguish between monumental tombs (longbarrows and megalithic tombs), flat earth graves, mortuary houses, Sarup-type enclosures, wetland depositions, and settlement finds.

Barrows

Longbarrows, elongated monuments constructed of earth and timber but without a primary stone chamber, are now recognized as the earliest form of monumental construction in a wide area from western Poland to northern France and England, and are also found in southern Scandinavia. More than 70 longbarrows are known from Denmark and between five and seven from southern Sweden ([Rudebeck 2002](#)). This is certainly only a small fraction of the original number of monuments. Dating of these monuments ranges over most of the early Neolithic, c. 4000–3300 cal BC. In a number of cases, longbarrows display complex series of alterations and embellishments, often ending with the addition of one or more stone chambers, thus converting them to long dolmens. In a few cases, EN burials have also been found under round barrows ([Ebbesen 1994](#)).

Human remains are not very well preserved in longbarrows, but in a few cases something may be said about the treatment of dead people. Commonly, one or two graves are found along the axis of the barrow, usually containing single graves but in some cases with up to four individuals. This was the case with the famous barrow at Bygholm Nørremark on Jutland, where a primary burial was found within a small oval house, interpreted as mortuary building. Only dental enamel was preserved, but this proved to be from a teenager, between 16 and 18 years old. Later, the barrow was enlarged and another grave, containing four individuals, was placed further west ([Jensen 2001](#)).

Another situation is found at Skipshøj, where a timber chamber at the eastern end, with the remains of five skeletons, was found ([Jørgensen 1977](#)). The bodies were laid out side by side on their backs in an orderly fashion, most likely buried within a very short time, after which the construction had been burned. The bodies were those

of an adult, between 20 and 30 years old, and four children of various ages. On the chest of the adult, a single jaw from a sixth individual had been placed.

Megalithic tombs

Three main types are usually distinguished: dolmens, passage graves, and gallery graves. Dolmens and passage graves were built in a rather short period c. 3300–3000 BC—that is, the transition between the early and the middle Neolithic periods, in the cultural setting of the Funnel Beaker culture ([Persson and Sjögren 1996, 2001](#); [Sjögren 2003](#)). The gallery graves, on the other hand, were built mainly in the late Neolithic.

Denmark, particularly the eastern parts, constitutes the main centre of megalith building in northern Europe. Today, about 7,000 tombs are known, but estimates of the original number range from 25,000 to 40,000 tombs, based on intensive surveys of limited areas ([Andersen 2000](#); [Jensen 2001](#)). In Sweden, about 525 dolmens and passage graves are known, but in the south especially, a large number of tombs have been destroyed ([Tilley 1996](#); [Midgley 2008](#)). The Swedish tombs occur in two distinct types of landscape. In Scania, Halland, and Bohuslän, they are found close to the coast ([Tilley 1996](#); [Sjögren 2003, 2004a, 2004b](#)). Another group of tombs is found in the inland area of Falbygden in Västergötland. Here, a spectacular concentration of at least 255 tombs coincides with one of the very few regions where bedrock consists of limestone and slate instead of primary rocks.

Numbers of humans interred in these tombs vary widely. In small dolmen chambers, usually regarded as early in the sequence, only one or a few persons seem to have been buried, although the number of sites with preserved bones is small. [Andersen \(2000\)](#) notes ten cases with more or less preserved skeletons from Denmark, the best known of which are the Kellerød, Frellesvig, and Ølstykke dolmens. In these cases, the burial practice seems to have been that of primary burial of complete bodies, placed on their back in extended position. The burials were accompanied by only a few artefacts, such as a pot or a flint axe.

In the somewhat larger Klokkehøj dolmen, a more complex situation was found ([Thorsen 1981](#)). In the bottom of the partly destroyed chamber, large parts of an intact primary burial were found, laid out on its back. The skeleton was from a 20–35 year-old male, and was dated to the early MN. Although the skeleton was largely intact, the cranium was missing along with the four upper neck vertebrae, suggesting intentional removal at an early stage of decomposition ([Thorsen 1981](#); [Kaul 1994](#)). Beside the male skeleton, parts of another

adult and the skull of a child of around five were found, also suggested as primary depositions. On top of the primary burial was a layer containing c. 500 bones forming three distinct concentrations. At least one of these concentrations was shown to have been formed at a recent disturbance of the chamber. The bones were from at least 19 to 20 individuals: 11 to 12 adults and eight children. No anatomical order was noted. Three radiocarbon datings of these bones suggest they were between 200 and 400 years later than the primary burial and belong to the final TRB. Based on the fragmented and disarticulated bones in the secondary layer, plus the low number of small hand and foot bones, Thorsen suggested that the burial practices had changed during the early MN. In the EN and the early MN, small numbers of people were buried and their bodies were placed intact in the chambers. Later, larger numbers of people were interred, but now in the form of already defleshed bones, as a form of secondary burial as has been proposed for Scandinavian passage graves.

For the partly disturbed Trekroner dolmen, a different practice has been suggested. Bones from about ten people were found: five adults and five children. The bones showed no anatomical order, and the different individuals were only represented by a few bones each ([Kaul 1994](#)). Since long bones and crania were under-represented, whilst small bones from hands and feet were largely present, Kaul suggested that complete bodies had originally been buried and selected bones later removed from the chamber for ceremonial use elsewhere.

In contrast to these rather small chambers, the minimum number of individuals in the passage graves is generally much higher, from a normal range of between 20 and 50 individuals up to 131 individuals in the Rössberga passage grave in Falbygden ([Ahlström 2001, 2009](#)).

Since the nineteenth century, the dominant view of burial practices in Scandinavian passage graves, as well as the larger dolmens, has been that of secondary burial and deposition of defleshed bones, using the chamber tombs as a kind of ossuary. Only a few scholars expressed other views, notably [Märta Strömberg \(1971\)](#), whilst the ossuary hypothesis was given new life by [Christopher Tilley and Michael Shanks \(1982\)](#). Shanks and Tilley saw burial practices as ideological, whereby social relations were not simply mirrored in mortuary activities, but social contradictions could be denied or masked equally as well as they could be demonstrated or emphasized. In the context of burials in megalithic tombs, they suggested that the mortuary practice was one of secondary burial resulting in the dissolution of individuality through practices of dismemberment and redeposition of human bones, and the creation of an anonymous collective of ancestors.

In later research, several authors have expressed similar ideas. For

instance, Sarup type enclosures have been suggested to have been localities for primary deposition and defleshing of human bodies (Andersen 1997, 2000), and fragmentation has been viewed as a widespread ideological practice involving not only human bodies but also artefacts such as pots or axes (Holten 2000). However, much of the evidence supports an alternative perspective, in which Neolithic bodies were rarely fragmented immediately following death (Ahlström 2001, 2004, 2009; Bennike 1985, 1990).

Shanks and Tilley based their arguments on the material from two Scanian passage graves, Carlshögen and Ramshög, excavated by Märta Strömberg (1971). Their arguments largely parallel those of Thorsen, suggesting that under-representation of small hand and foot bones is not due to taphonomical loss within the chambers but to selective processes resulting from handling of bodies outside megalith chambers. However, the human bone material from southern Scandinavia must be characterized as poorly preserved and/or poorly studied. As an example, the bone material from Carlshögen studied by Shanks and Tilley only comprises c. 400 identified bone fragments, yet supposedly represents more than fifty individuals (Lepiksaar 1971). Only one tomb, the Hulbjerg passage grave on Langeland, has well-preserved and well-studied bone material (Bennike 1985). Yet the radiocarbon dates taken after Bennike's study indicate a late Neolithic date for this material. From older excavations, only a small proportion of the bones recovered remain today in the museum collections.

A different situation is noted in Falbygden in Sweden, where recent excavations at the sites of Landbogården and Frälsegården have given new information about burial practices. At both sites, a situation similar to the one at Klokkehøj was found; intact skeletons, presumably from primary burials, in the bottom layer, covered by a layer with largely disarticulated and fragmented bones. At Landbogården, a rectangular passage grave only 2.7m long was excavated in 1987 (Bägerfeldt 1987; Persson and Sjögren 2001). The bones have been analysed by Ahlström (2009). In the bottom of the chamber, three individuals were found, lying on their sides in contracted positions. Two of these, an adult man and an adult woman, have been dated to the MN A, whilst the date of the lowermost skeleton, a woman of between 40 and 50 years of age, has been controversial. The first dates put this woman in the early Neolithic, but it has now been redated and the new dating is similar to that of the other two individuals (Sjögren 2011). A tight concentration of disarticulated bones from two persons, an adult male and a child, was found in the passage. These were dated to the same period as the skeletons in the chamber.



FIG. 52.1. Skeleton of a 40–50-year-old woman from Frälsegården.

(From [Sjögren 2008](#)).

At Frälsegården, only 2km from Landbogården, a ploughed-over passage grave was excavated in 2001 ([Ahlström 2004, 2009](#); [Sjögren 2008](#)). The partly damaged bone layer contained some 9,800 bone fragments, but also some almost intact skeletons, as well as partial skeletons in various stages of decomposition ([Fig. 52.1](#)). In several cases, intact hands and feet could be observed, and the presence of many small, fragile, and easily detached bones was notable. The preserved bodies were mostly in contracted positions, and the presence of numerous pig phalanges suggests they were wrapped in the skins of these animals. As suggested by Ahlström, the bodies may originally have been placed in sitting positions. In the northern part of the chamber, three skulls were found close together, and in the passage a shallow pit contained numerous smaller bones without anatomical connections.

The special arrangements of bones, like the skull group and pit at Frälsegården and the bone package in the passage at Landbogården, merit further discussion. Several older excavations have recorded bones arranged in heaps; often a group of disarticulated bones including a skull, for instance at Liepen 1 in Mecklenburg ([Schuldt 1972, 73–75](#)) or at Carlshögen ([Strömberg 1971, 247](#)). In other tombs, such as Rævehøj and Kyndeløse, skulls and long bones were sorted out

and placed in particular areas; that is, practices similar to those at Landbogården and Frälsegården (Fig. 52.2; Kaul 1994). The special treatment of skulls is evident in many cases, also in the lack of skulls in sites such as Trekroner or the missing skull in the primary grave at Klokkehøj. It is difficult to determine when these rearrangements were made; did they follow the original deposition of a body or bone collection, or were they practices from a much later period in time? In the first case, they could be seen as part of an extended burial ritual involving displacements within the chamber, but in the second case, it would rather be the case of ancestral rites or simply of rearrangements to make room for new burials.

In other cases disarticulated bones have been found in pits below the chamber floor, or sealed within the wall constructions. Kaul (1994) has listed several examples, such as a tripartite pit below the chamber floor at Carlshögen. One of the branches of the pit contained a skull, another one a collection of vertebrae, and the third one a group of mixed bones. This and similar deposits have been suggested to represent foundation deposits of bones from ancestors. In the case of Carlshögen, however, the radiocarbon date from these bones suggests they were deposited well after the construction of the tomb, at the end of the TRB sequence in the region. Unfortunately, this is the only case where such a deposit has been dated, and the argument mainly rests on the find contexts.

Human bones in megalithic tombs fall basically into four categories: whole or partial skeletons, disarticulated bones, bones arranged in special deposits, and burnt bones, often deposited in front of the entrance. As seen above, opposing interpretations have been suggested for the burial practices in these tombs. On the one hand we have the ossuary hypothesis, involving extended secondary burial and practices carried out at more than one location. On the other, we have the hypothesis that complete bodies were interred. Later, these would have been rearranged or bones taken out of the chambers to be used in some form of ancestral ceremony, or perhaps to be placed in foundation deposits at other tombs. To complicate matters, it is possible that burial practices changed over time, that they vary between sites, or that both practices could occur together.

As a result of recent excavations and analyses, there can be little doubt that at least some of the bodies, both in dolmens and passage graves, were primary burials, and that part of the chaotic appearance of the chamber contents must be due to extended periods of use and later disturbance. The main argument for secondary burial has often been the under-representation of certain categories of bones, for instance small hand and foot bones, supposed to result from loss outside the chambers when the defleshed bones were handled and

transported. However, as [Bennike \(1985, 1990\)](#) and [Ahlström \(2009\)](#) have argued, such patterns may also indicate taphonomic loss within the chambers. Indeed, almost identical patterns can be seen in the bone frequencies in cemeteries from historic periods ([Ahlström 2009](#)).

Until better reference material regarding taphonomic loss and differential breakdown of bones is available, it is not easy to evaluate the two main proposals, but it would seem at present that the ossuary hypothesis does not have very strong arguments in its favour. If this is the case, we may well have very different practices going on from those commonly envisaged. Instead of fragmented individuals and anonymous collectivities of ancestors, bodies would have been put in the chambers in a complete state, perhaps wrapped in skins. Instead of rapid breakdown, conditions in the chambers could well have favoured mummification or the development of adipocere ([Ahlström 2001](#)). In other words, the bodies could have remained intact for long periods, perhaps generations, and their specific individuality, as well as their place within the chamber, retained and recorded by the living community. Social identity would then rather be expressed by reference to specific genealogical links than by general reference to an ancestral community. The ideological importance of genealogical knowledge, and the central position of those persons possessing it, is evident in such a system.

The selective use of certain body parts suggested by the special treatment afforded to skulls and long bones could in such cases be viewed as an instrument of legitimation, perhaps emphasizing specific ancestral links when creating new monuments or performing certain kinds of ritual, for instance at enclosed, Sarup-type sites (see below). However, until detailed comparative studies of bones from different kinds of sites have been made, this remains a hypothesis.

Flat graves

Flat graves occur alongside monumental tombs throughout the TRB ([Ebbesen 1994](#); [Kossian 2005](#)). Burial in flat earth graves is also characteristic for the late MN PWC and BAC in Sweden, whilst the Danish Single Grave culture is characterized by inhumation burials under low round mounds ([Janzon 1974](#); [Malmer 1962, 2002](#); [Hübner 2005](#)). Occasionally, burials from these groups are also found in megaliths, gallery graves or in small stone cists.

In TRB graves, usually one or two persons have been laid down in extended or contracted position, accompanied by only a few artefacts such as a flint axe or a pot. There is not much to distinguish the artefacts in these graves from those found in longbarrows or megalithic tombs. [Tilley \(1996\)](#) has noted the preference for

combinations containing axes in flat graves and pots in dolmen chambers, although one type of grave cannot be said to be 'richer' than the other. The reasons for this difference may be a combination of chronological difference and different regional traditions. The anthropological evidence from flat graves is scant. Only in a few cases, such as Dragsholm and Lohals in Denmark and the large grave field at Ostorf in Germany, is anything more than tooth enamel preserved. In the light of the currently available evidence, most of the cases are compatible with the practice of primary burial. In some cases, however, there are indications of secondary burial or manipulation of bones. At Fakkemose on Langeland ([Skaarup 1985](#), 206), a flat grave was found underneath a dolmen, with the skeletons of two adults in apparently anatomical position. However, one of the femurs was found lying in the wrong direction, suggesting some rearrangement of bones, perhaps to simulate an intact skeleton. Indications of secondary manipulations also come from German graves, such as at Ostorf ([Kossian 2005](#)).

The relation of flat graves to the contemporary monumental tombs is an intriguing question, but difficult to answer. Flat graves are found in all regions, even where megaliths were never built, and could perhaps be seen as the 'normal' form of burial for TRB populations. Their spatial contexts vary widely, however. Earth graves may be found isolated, scattered at settlements, as groups or small grave fields, or adjacent to longbarrows or megalithic tombs. Both adults and children have been buried in this way, with no apparent distinction in the form of burial or accompanying grave goods. In a few cases, such as at Borgeby in Scania ([Runcis 2002](#)) and Lindebjerg on Själland ([Liversage 1981](#)), only children seem to be present, suggesting spatial segregation of age categories. In other cases, such as Ostorf, all age categories are present ([Kossian 2005](#)).

The Swedish PWC and BAC graves are broadly similar, but have complementary distributions. BAC graves are found over most of the south Swedish mainland, whilst PWC graves are mostly found on the Baltic islands Öland and Gotland and in the adjacent coastal areas of eastern Sweden ([Malmer 1962, 2002](#); [Janzon 1974](#)). Both are inhumations, usually single graves but on occasion with two or more people ([Fig. 52.3](#)). Most likely, they are primary burials, although bone is rarely preserved in the mainland graves. The BAC graves exhibit a rather strict patterning, probably emphasizing distinctions between sexes through body position and grave goods. This is also the case for the related Single Grave culture in Denmark. They are usually viewed as some form of elite burial, whereby further social distinctions are introduced. In contrast, the PWC burials are less strictly controlled, and probably contained larger proportions of the

population. Even here, however, age and sex distinctions are expressed through variations in the grave goods. For instance, bone points and shaft-hole axes are primarily found in male graves. Bone and shell cylinders are usually found in the graves of younger persons (15–25 years) of both sexes, whilst pottery is mostly found with adults (Janzon 1974). At the same time, many types of artefacts, such as flint axes and animal tooth beads, cross-cut age and sex classes, and sometimes principles vary between different grave fields. In the grave field at Ajvide on Gotland, 82 graves have been excavated (Österholm 2008). Primary burial in extended position is the preferred practice, although some were also in contracted position. Also, a small building was found among the graves, probably used in connection with mortuary rites. Notably, some of the graves had been cut off in the head end by later graves, most probably intentionally, and the crania taken away. Some form of ritual involving ancestral skulls is perhaps indicated by such practices, making the PWC mortuary customs more complex than would appear at first sight.

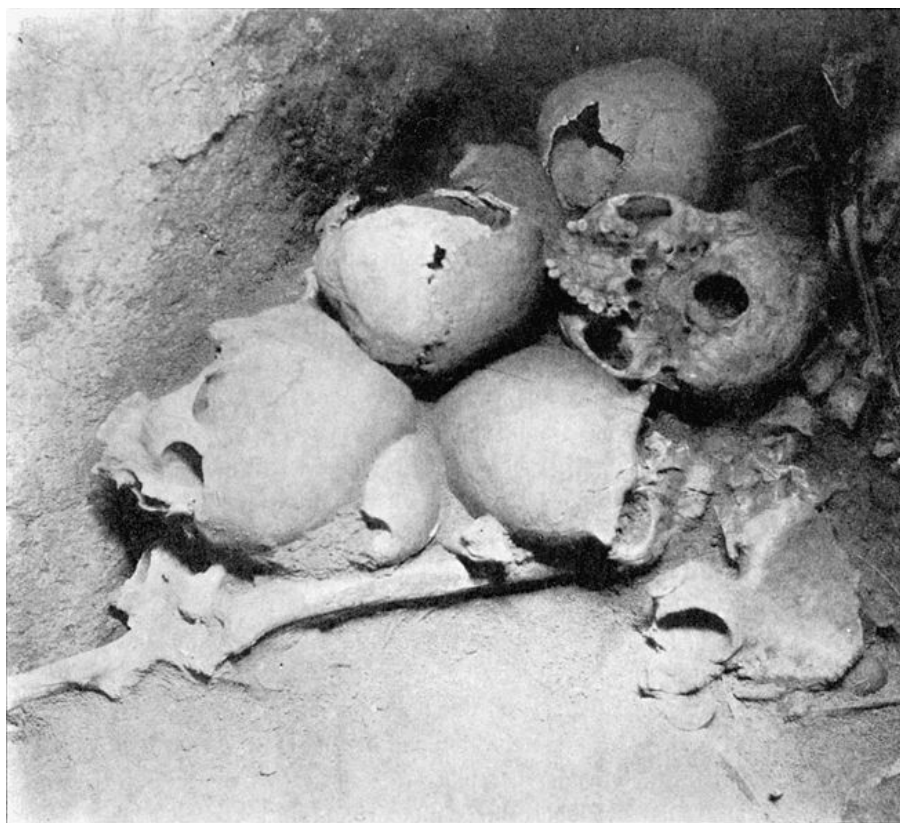


FIG. 52.2. Collection of crania in the passage grave Rævehøj.

(From Nordman 1918).



FIG. 52.3. Graves 1 (bottom) and 2 (top) at the PWC gravefield at Ajvide, Gotland.

(From [Österholm 2008](#). Photograph: Göran Burenhult).

Cremations have only recently become recognized as more than a marginal feature in Neolithic mortuary practices. A series of excavations mainly in eastern Sweden have revealed the systematic occurrence of cremation burials from both early and middle Neolithic periods ([Larsson 2003](#); [Hallgren 2008](#)). Cremated human bones are found both in small pits and stone settings, often without much accompanying grave goods, and were virtually impossible to distinguish from metal age burials before the possibility to date cremated bone. In addition, cremated human bone is also found in small buildings, that is, ‘mortuary houses’ (see below). Culturally, cremations occur in all complexes; TRB, PWC, and BAC. In southern Scandinavia, cremated bones are also known, from both megalithic tombs and from Sarup enclosures, but have received little attention until recently.

Cremation may in itself be seen as a form of extended, ‘secondary’ burial practice. Based on studies of fracture patterns in the bones from Bollbacken (see below), [Larsson \(2003\)](#) has argued that the bones were already dry when burnt—that is, the burning had been preceded by a period long enough for the flesh to rot away. In this way, perhaps we return to the notion of secondary burial in the context where we least expect it, in the non-megalithic and non-monumental burial tradition of the largely hunting and fishing PWC culture of eastern Sweden.

Mortuary houses

These small buildings, often adjacent to megalithic tombs and containing large amounts of richly decorated pottery, were first identified in Jutland ([Fabricius and Becker 1996](#)). Since no bones were preserved, their function was unclear. Recently, however, excavations in eastern Sweden have uncovered a series of probable mortuary houses, at sites like Fågelbacken (TRB), Bollbacken (PWC), and Turinge (BAC) ([Hallgren 2008](#); [Arthursson 1996](#); [Lindström 2000, 2006](#)). Unlike in Denmark, these sites are not limited to TRB contexts, and cremated bones have been commonly discovered during excavation. For instance, at Bollbacken cremations were found in pits both within and just outside the house ([Fig. 52.4](#)). The complex was fenced off from the nearby settlement by a semicircular row of posts. In the Turinge house, remains of at least seven cremated people were found, distributed in small pits along the walls. Men, women, and children were identified.



FIG. 52.4. The mortuary house at Bollbacken under excavation.

(From Artursson 1996).

Enclosures

The occurrence of human remains in the ditches of causewayed enclosures (in Scandinavia called Sarup enclosures) is often commented upon. Although preservation is far from ideal, some of the Danish sites have yielded human remains ([Andersen 1997, 2000](#); [Nielsen 2004](#)): Sarup, Hygind, Åsum Enggård, and Bundsø. In all cases, the bones consist of skulls, jaws, or long bones. A connection to megaliths is also suggested by the find of a miniature dolmen in one of the system ditches at Sarup Gamle Skole, close to the classic Sarup site. The Sarup-type sites have been suggested by Andersen to be parts of a funerary cycle, involving temporary burial and/or primary defleshing of bodies at these sites and later transfer to megalithic tombs ([Andersen 1997, 2000](#)). As suggested above, an alternative scenario may be more likely: the use of selected bones taken from the

tombs in order to emphasize ancestral links.

In this context, the remarkable site at Alvastra in eastern Sweden must be mentioned. This is a wooden platform on wet ground, thought to have fulfilled a similar function as the Sarup enclosures. On the platform were numerous hearths, finds of cereals and other vegetables, animal bones, pottery, etc. ([Browall 1986, 2003](#); [Malmer 2002](#)). The use of the platform seems to span most of the MN A, although the actual construction is confined to a short period. In cultural terms, most of the finds have a PWC or general MN character, but TRB pottery has also been found. Also, a substantial number of human bones from some 45 individuals, mostly men and boys, were found ([Browall 2003, 2011](#)). Unfortunately, the analysis of the bones has yet to be published, and the relation to the nearby dolmen is unclear.

Wetlands

In recent years, the practice of depositing human bodies in bogs or springs has been clarified as a result of radiocarbon dating programmes. Bog deposition of complete bodies occurs mainly in the EN and early MN throughout Denmark and southern Sweden, so far only connected to TRB contexts ([Karsten 1994](#); [Koch 1998](#); [Bennike 1999](#)). Bennike's studies indicate that a very particular segment of the population was treated in this way. Most of these persons were quite young, between 16 and 20 years old, and some of them show signs of trauma, disease, or malformations. In a few cases the remains of a cord were found around the neck. The suggestion is that these people suffered violent deaths, perhaps most likely in sacrificial ceremonies, although other explanations cannot be ruled out.

Another category of wetland finds comprises disarticulated human bones, often in connection with other finds such as animal bones, pottery, or flint axes. Such finds have been made for instance at Gammellung, close to the classic Troldebjerg site, and at Myrebjerg mose, also on Langeland. These finds have not been studied in detail, but skulls and long bones seem to figure prominently, and the age distribution seems not to be as restricted as for the complete skeletons ([Skaarup 1985](#)).

Settlements

Scattered human remains are commonly found in settlement contexts, where there are suitable conditions for bone preservation. As yet these finds have not been studied in detail, though [Kossian \(2005, 145ff\)](#)

has produced a survey of human bones from TRB settlements. Human bones are also found at PWC sites, whilst BAC settlements have not produced many bones so far. In some cases, such as at the TRB settlements at Koustrup and Bistoft, these bones show signs of intentional breakage and/or reworking into tools. Some of these bones also exhibit signs of traumatic violence, something which is rare in contemporary graves (Ahlström, pers. comm.).

The interpretation of such finds is unclear. Disturbed earth graves, killed enemies, cannibalism, bones from ancestors, or remnants from primary burials of individuals transferred to other forms of burial have been suggested. Until more detailed studies have been made, it is difficult to say which hypothesis is the more likely, but it would seem that there are some differences in treatment between these finds and those from megalithic tombs and earth graves. I would therefore view them as part of a different series of practices.

Special treatment

Finally, there have been a series of finds where human remains, particularly skulls, have been subject to very special kinds of treatment: trepanations, scalping, and transformation into artefacts. Prehistoric trepanation has long been claimed for the Scandinavian Neolithic as well as later periods ([Bennike 1985](#)). Recently, these finds have been re-evaluated, and it now seems that most if not all of the cases may be attributed to diseases or healed wounds rather than surgical procedures ([Bennike 2003](#)). In these cases, then, special treatment may be dismissed, but there are other skulls which do show signs of unusual activity. Cut marks, probably indicating scalping, have been noted in a few cases, for instance from Bundsø and Alvastra ([Kossian 2005](#); [Browall 2003](#)). An extreme example of ‘special treatment’ is the find from Ringsjön-Sjöholmen in Scania, where two human skulls had been reworked into a bowl and a spoon. This was probably also the case with another skull fragment from Bundsø ([Kossian 2005](#)).

CONCLUDING REMARKS

As evident from the overview given here, it is hard to generalize about Neolithic burial practices, partly due to problems of preservation and uneven archaeological study, but also because of the complexity of the practices involving human remains. We have little evidence regarding the variability of burial practices within a given period, although as more sites are being studied one would expect the variability to rise

considerably, and appear less monolithic than present models suggest. However, a few comments can be made.

For the TRB period, present knowledge indicates a complex set of rituals, probably not all funerary, involving human remains at different kinds of sites. At present, most evidence seems to support a practice of primary burial in monumental tombs or flat graves, followed by secondary removal of selected bones, some of which were then handled at other places, such as Sarup enclosures or perhaps settlements, or possibly when founding a new tomb. There does not seem to be much support for the various ideas suggesting the use of megaliths as ossuaries, or the intentional fragmentation and de-individualization of humans through mortuary practices. Rather, preservation of individual identity within the tombs may well have lasted for generations. The use or re-use of bones from these persons would have emphasized specific genealogic linkages, certainly a forceful legitimation tool. The social distinctions behind the different forms of burial are little understood, but burial in megalithic chambers seems to be restricted to a selected segment of the population, perhaps in the form of higher ranking clans or kinship groups.

For the MN period, the PWC, BAC, and Single Grave cultures have always been thought of as rather straightforward, mainly making primary burials in flat graves or small barrows, representing the breakthrough of individualism as opposed to the communal society proposed for the TRB. Recent investigations suggest a much more complex situation, however, and we may certainly expect further surprises in the future.

One issue that so far has received too little attention regards the co-existence of different practices. It now seems probable that burial in megalithic chambers and in flat graves, as well as some form of rituals involving human bones at settlements and enclosed sites were at least partially contemporary. Likewise, during the later MN, inhumation in PWC, BAC, and Single Grave culture burials were only a part of a spectrum involving also re-use of megaliths, cremations, deposition in mortuary houses, and possibly ceremonies at a second generation of enclosed sites. The interpretation of these different practices is far from clear, and a lot more detailed comparative studies on these questions are needed. Interestingly, many of these practices seem to cross-cut the traditional culture-historical divisions we use to try and make sense of the material. In my view, we would perhaps be better off putting these distinctions aside and looking instead in more in depth at the details of the material and the practices we may infer from them.

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CHAPTER 53

MORTUARY PRACTICES AND BODILY REPRESENTATIONS IN NORTH-WEST EUROPE

CHRIS FOWLER AND CHRIS SCARRE

INTRODUCTION

A diverse range of mortuary practices are documented from Neolithic north-west Europe. Some bodies were buried complete (singly or in groups, simultaneously or successively), whilst others were exposed to the elements, actively defleshed or disarticulated, or cremated. Structures in which bodies had been deposited might be burnt or later elaborated, whilst the skeletal elements of the dead were sometimes further manipulated. Whilst the majority of the population are under-represented in the surviving mortuary evidence, inferences about personhood, ancestry, community, and understandings of the body can be drawn from the mortuary evidence from Britain, Ireland and northern France, c. 5300–2250 BC, and from rare but intriguing figurative representations.

Three themes run through this analysis: the integrity of the body, the presentation of the body, and the representation of the body. *Integrity* refers to the treatment of the corpse, and in particular the degree to which it is kept intact after death. Inhumation in a single grave greatly respects the integrity of the corpse whilst a cremation in which the ashes are collected and placed in a pit or container without further manipulation respects such integrity to a lesser extent. Other practices more clearly disrupt bodily integrity through manipulation of the corpse or the decomposed or cremated remains of that corpse. *Presentation* in this context refers to the way in which the body is ‘dressed up’ for the act of transformation, most evident to us when the body is buried intact: the kinds of objects, ornaments, and clothing that are involved. This is not to resurrect the notion of a single identity expressed in grave goods; material objects placed in the grave may represent multiple aspects of identity that connect the living to

the dead and may relate to different stages in funerary narrative. In depositing grave goods, onlookers might consider that they are donating parts of their own personalities with the dead, rather than exemplifying the personality or individuality of the deceased, or that they are facilitating a transformation of the deceased and/or depositing items used in funerary rites. *Representation* refers to the presentation of human bodies (or parts thereof) in media other than the human body itself. Figurative representations include figurines, motifs on pottery or in rock art, and statue-menhirs. There are ambiguities over who or what was being represented: a living person, a mythical ancestor, a shadowy (and perhaps only part-human) deity? Other representations are even more ambiguous: it is possible that tombs and other media represented bodies in a less figurative way, or were understood as manifestations of a collective body, whilst some but not all shouldered menhirs may have been intended as anthropomorphs. A distinction between presenting and representing bodies might be more our concern than that of Neolithic communities. Diverse and recurring intersections between these three themes underpin our discussion of funerary treatment and body symbolism in Neolithic north-west Europe.

BURIALS IN EARLY CEMETERIES IN NORTHERN FRANCE

Cemeteries of single inhumations, almost unknown in early Neolithic Britain, were a feature of the early Neolithic in northern France. At Vignely, Seine-et-Marne, used over a long period c. 4500–3600 BC, detailed observation of taphonomic processes within a group of non-monumental graves has provided evidence for one body placed in a wooden coffin, another in an open-topped bier, and others tied or wrapped in shrouds and laid on the back or crouched on one side ([Chambon and Lanchon 2003, fig. 53.1](#)). An unwrapped body on an open-topped bier would have been presented to mourners as the visible remains of a recognizable person, whilst bodies buried in closed coffins or wrapped in shrouds offered alternative visual images of the deceased. The shrouds or encasements may have borne symbolic markings, but they hid the faces and bodies of corpses as these passed through the funeral rite.

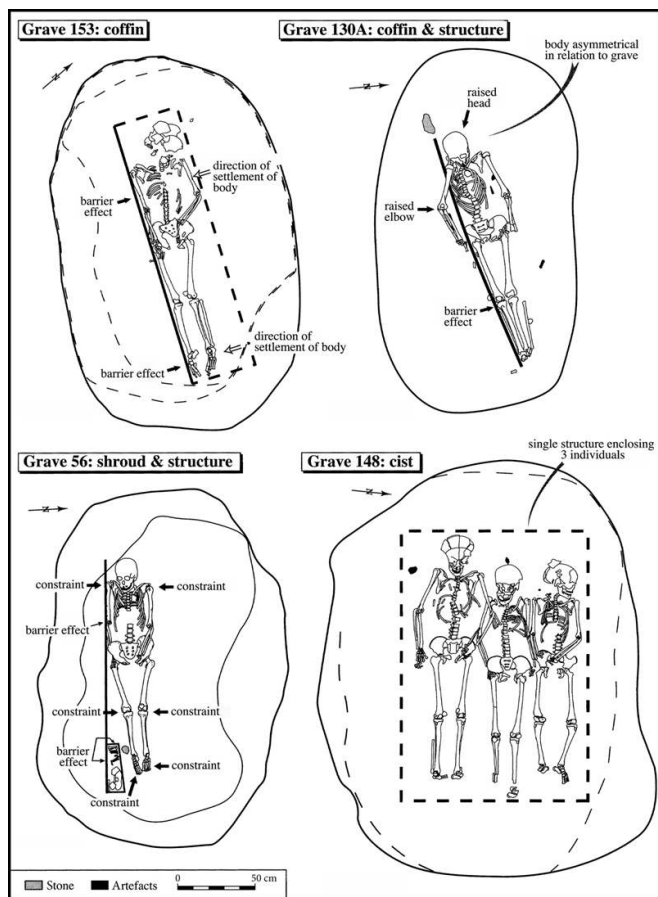


FIG. 53.1. Vignely (Seine-et-Marne, France): selected middle Neolithic graves indicating the variability of burial arrangements and the detection of organic coffins and containers from detailed examination of skeletal positioning.

(Diagram courtesy of Philippe Chambon, translation of labels Chris Scarre).

Single grave cemeteries allow us to determine how bodies were routinely dressed up for burial: the kinds of objects, ornaments, and clothing that were involved, and by extension the entirety of the grave goods. At Vignely, for example, one of the dead wore a necklace of fossil shell beads, another had a boar's tusk pendant, yet others had polished stone blades or pottery vessels. Thus, even though objects were not present or preserved in the majority of the 34 graves in this cemetery, it is clear that the burial performance itself frequently involved placing selected items with the dead.

The earlier Bandkeramik farming communities of northern France had buried the dead in crouched position resting on one side, without any covering mound or monument. The mid-fifth millennium Passy tombs of Burgundy reveal a strikingly new presentation of the corpse, one which was emphasized by the laying out of the deceased extended

on the back, by the personal accoutrements which stressed the role of hunting, and by the provision of a long mound up to 280m in length (Sidéra 2000; Duhamel 1997). This was a localized phenomenon, but it illustrates the growing visibility of a community of the selected dead who were identified in a specific way during the fifth millennium BC. At the Passy necropolis itself a single grave (Passy 5.1) contained pendants of boar's tusk and dog canine; an antler mace head; a series of 12 flint arrowheads grouped together near the right leg (presumably the remains of a quiver of arrows); several sea shells, including a perforated disk of mother-of-pearl and a cockleshell held in the left hand; various other tools of flint and bone; and two pottery vessels (Duhamel 1997). A flint scraper could have served for the manufacture of bow and arrow shafts (Sidéra 1997, 507). Identities in death do not necessarily relate to the social role or profile of the deceased—and it is possible that some grave goods were items used in the funerary transformation of the dead, or gifts from the living to the dead, rather than possessions of the deceased. Indeed, arrowheads were buried even in graves of individuals (children, handicapped) who can never have drawn a bow in life (Chambon and Pétilion 2009). Nonetheless, grave goods are suggestive of the social importance of specific statements about bodily practice and idealised identities. Passy burial 5.1 hence appears to emphasize the prestige of hunting, and familiarity with wild animals and the seashore in a society dependent on domesticated animals.

MORTUARY PRACTICES AT EARLY TOMBS

Some of the earliest evidence across north-west Europe indicates successive (or perhaps even simultaneous) single burial in collective tombs. At Ernes/Condé-sur-Ifs in western Normandy a series of early fourth-millennium BC stone chambers contained a small number of articulated skeletons, generally crouched on one side. In La Bruyère du Hamel chamber C, 12 bodies had been placed in two groups around the walls of the chamber with almost no overlap between them (Dron et al. 2003). Such respect for the integrity of the corpse was not a standardized practice and other tomb chambers in the region illustrate an entirely different pattern. At Vierville, two chambers within the same mound contained disarticulated remains of 28 and between 24 and 38 individuals respectively. The presence of several articulations suggests that corpses had been intact or partially intact when initially deposited (Dron et al. 2003), and the commingled nature of the remains indicates secondary manipulation after deposition. The complementarity of these practices is

emphasized by their presence at La Hoguette within different chambers of a single monument: articulated skeletons within chambers I, II, III, VI, and VII, commingled remains in chambers IV and V ([Dron et al. 2003](#); [Piera 2003](#)).

At other tombs, individual skeletons became both disarticulated and incomplete: this is the pattern found south of the Loire for example at Bougon, at Prissé-la-Charrière, and at Champ Châlon ([Mohen and Scarre 2002](#); [Soler et al. 2003](#); [Joussaume 2006](#)). The radiocarbon date sequences from the two passage graves within the Prissé-la-Charrière long mound indicate that funerary deposition occurred over at most a few generations, c. 4400–4200 BC ([Soler et al. 2003](#)). Although relatively few articulations were preserved and the skeletal elements were commingled, only a small number of individuals was represented in each chamber. The site provides an arrested snapshot of a cyclical process of deposition and removal in which many bodies passed through the chamber, remaining there until they were defleshed and the dry bones removed.

Intact bodies were entombed successively over a period of probably less than 35 years at West Kennet, Wiltshire, during the thirty-seventh century BC, and disturbed during later activity at the tomb ([Bayliss et al. 2007](#)). At a number of tombs in Britain and Ireland remains were disturbed during the deposition of further bodies, such as Hazleton North, Gloucestershire ([Meadows et al. 2007](#)) or Parknabinnia, County Clare, where old bones were swept aside as new bodies were introduced ([Beckett and Robb 2006](#)). Such successive burial practices eventually left a pattern of dispersed and partial skeletal remains. Arrangements of bones in other chambered tombs suggest that this was not always a haphazard disruption but may have involved sorting or stacking bones, whilst in some cases the bones of the long-dead were manipulated without the introduction of further corpses (see [Fowler 2010](#), 11–13 for a summary). To give just one example, at Millin Bay, Ireland, skulls and longbones had been separated from other commingled bones, and some teeth had been forced into the wrong sockets ([Cooney 2000](#), 122). It is possible some bones or objects were removed from chambers, though it is often difficult to establish this with certainty ([Smith and Brickley 2009](#), 69–73). Stalled cairns in Orkney and Caithness provided opportunity for prolonged contact with the dead. Bones were moved within the chambers: at Knowe of Yarso skulls were stacked in the rear stall, but no mandibles were found ([Richards 1988](#), 49; [Sharples 1985](#), 67). [Reilly \(2003\)](#) suggests that bones were even moved *between* some of the stalled cairns on Rousay, with skulls taken from the lowest-lying tombs to the highest ones on the island, such as Knowe of Yarso. Here we could suggest that the deceased were gradually transformed as distinct

bodily elements became associated with specific parts of the landscape, possibly during an extended mortuary process.

Other tombs provide evidence for mortuary practices that radically transformed the body soon after death. Cremated bones have been recovered from more than 50 chambered tombs in Britain and Ireland and perhaps cremation without interring the remains was yet more common. In Irish court tombs and passage graves, adults were predominantly cremated, but children rarely so (Herity 1987), suggesting a distinction between the personhood of children and adults (Cooney 1992; 2000, 125–126). Across Britain and into northern Ireland some bodies were laid out in groups in wooden chambers and burnt with the structures, as at Street House (Vyner 1984). In other cases bones were charred by fires within stone chambers. In such cases burning simultaneously transformed the mortuary site and the dead who had become integral to that place (Fowler 2010).

In Irish court tombs and passage graves, objects found with cremated bones were often burnt. Herity (1987) points out that similar artefacts survive in a number of court tombs where conditions have not preserved unburnt bones. Typically, these objects include bone pins, beads, flint knives, and scrapers, suggesting that bodies were dressed and presented with quotidian tools during the funerary rite. In some cases potsherds and/or animal bones or complete animal carcasses have been found with the dead, as in Orkney (Jones 1998), or at Cotswold–Severn tombs where the remains of foetal or neonatal animals were sometimes placed in tombs (Thomas and McFadyen 2010). Fragmentary, probably disturbed, remains of pots and/or ornaments such as beads and bone pins have been recovered from some British chambers. In cases where there are few artefacts in the tomb it is hard to know whether objects associated with the deceased were retained by the living following the funeral, disposed of elsewhere, or removed from chambers in later interventions.

Some of the remains deposited in Irish Linkardstown tombs (c. 3600–3300 BC) may have been exposed to the elements beforehand (Beckett and Robb 2006, 59). Smith (2006) has identified that the bones of at least four individuals which were placed in the Adlestrop chambered tomb, Oxfordshire, had been chewed by dogs or wolves for a period of weeks before deposition, and similar findings have been made at other British sites (e.g. Whittle and Wysocki 1998, 155–157). Two of the bodies from a collective burial at Wayland's Smithy I showed signs of scavenging by canids whilst two arrowheads were embedded in skeletal remains from the chamber, and it has been suggested that relatives found and collected up the bodies of these people who had died in a violent clash and been left by their killers

(Schulting and Wysocki 2005, 127–128; Whittle et al. 2007, 107). This might also explain why some other human remains from the period display injuries and/or signs of exposure, though the association of cut-marked and scavenged bones at Adlestrop, for instance, hints at a wider range of practices. Some cut-marks suggest the removal of heads (e.g. Smith and Brickley 2009, 49–52) or limbs from partially decayed bodies (e.g. Wakeley in Evans and Hodder 2006, 147–149), and an ear appears to have been cut from a head deposited at Coldrum, Kent (Schulting and Wysocki 2005, 129), but others seem to have been made just to mark bare bone.

Given the low number of surviving remains we must assume that most of the Neolithic dead were not buried or left to rest in tombs. Exposure or dispersal following cremation may have been more normal funerary options—requiring us to reflect on exactly under what circumstances interring remains in the earth or tomb was deemed necessary. Smith and Brickley (2009, 88–90) determined that c. 62% of sexed remains from chambers in southern Britain were male, rising to 85% at Wayland's Smithy I, and Schulting and Wysocki (2005, 114) report evidence of violent trauma to men, women and an adolescent from studying crania alone, mostly those found at tombs. Whilst it is possible that such traumata are (under)representative of background levels of violence, it is also possible that some monuments were appropriate places for the remains of those who died violent, unexpected or 'abnormal' deaths—in some regions it may even have been necessary to build certain monuments to 'contain' such deaths (Fowler 2010).

MORTUARY PRACTICES AT LATER TOMBS

Irish passage graves were built and used into the third millennium BC. The majority of the dead there were cremated, and sometimes bones from a significant number of individuals accumulated, with at least 181 adults from the tomb at the Mound of the Hostages, Tara (O'Sullivan 2005, 237). The bones were intermixed with bone pins, beads and pendants, stone balls, and Carrowkeel bowls, and placed in chambers and cists. Irish middle and late Neolithic tombs were also frequently part of larger complexes, situating the transformation of the dead within sophisticated choreographies of experience. At Fourknocks, a trench was used to cremate bones then taken to a nearby passage grave, and the cremation trench was later covered by a cairn and kerb, imitating a passage grave. The site displays an emphasis on cremating adult bodies, and child and adult remains were kept separate at the tomb (Cooney 2000, 103–112). At Mound of the

Hostages, three cists held the cremated remains of 56 adults, dated to c. 3350–2900 BC, accompanied by the remains of seven unburnt children. O’Sullivan (2005, 237–238) also reports that ‘inhumed infant bones were found occasionally in virtually every significant collection of cremated bone’ across the site. Unburnt skulls, all from adults, were recovered from the chambers: these were probably deposited as skulls and have slightly later dates than the cremated remains. Overall, age distinctions seem highly relevant to the treatment of the dead during this period.

Only in a few places in Britain did tomb construction continue through the middle and into the later Neolithic, notably in the form of passage graves on Orkney. At Quanterness, Richards (1988, 50) has argued that the jumbled unburnt bones from 157 bodies with a broad span of radiocarbon dates were brought to the tomb from older, smaller tombs, collected together as several communities came to share a single identity. He argues that as the social body of the community expanded in scale, so the ancestral bodies of those communities became combined. Middle and later Neolithic objects have been found in some earlier Neolithic tombs in Britain, even though the entrances to these were by now blocked off (Thomas 1996, 171–172). These objects (and those at other locations) may be votive offerings and/or extensions of persons, or possibly belonged to recently deceased persons whose bodily remains were processed elsewhere. Some late Neolithic graves were cut into older mounds: at Whitegrounds, Yorkshire, a crouched inhumation of an adult male with a jet belt-slider and a flint axe was inserted into a chambered long cairn subsequently adapted to become a round barrow (Brewster 1984).

In western France, many earlier tombs were re-used (or continued in use) into the later fourth millennium and beyond. The disarticulated, intermixed, and incomplete skeletons of much larger numbers of bodies than before dominated the chambers of French fourth millennium sites, both in the western France (e.g. Tumulus A at Bougon which reportedly contained the remains of between 150 and 200 individuals: Mohen and Scarre 2002), and in the Paris basin and northern France, where sites such as La Chaussée-Tirancourt contain remains of over 200 individuals (Masset 1997). This is a typical ‘*allée sépulcrale*’, an elongated rectangular chamber with entrance and ante-chamber at one end. A series of successive burial deposits spanning the period c. 3200 to c. 2300 BC reveal changes in the arrangement and reordering of skeletal material over time (Fig. 53.2). The burials of the first phase are almost invisible to us, having been carefully removed, leaving only a few small fragments. In the second phase the interior of the monument was used as a structured whole, with bodies

stacked extended in the central space, surrounded by a circulation corridor. Periodically, when the space became too full, bones were rearranged throughout the chamber. In the third phase, a new chalk floor was laid over these earlier burials and the interior reorganized. Individual burial containers of organic material were installed, perhaps for individual families or lineages; these were simply closed up and topped by selected skeletal elements when they became full. This partitioning of the tomb interior could indicate that the earlier sense of community and co-ordination was abandoned (Leclerc and Masset 2006), or suggest the emergence of a more distinct delineation of lineages within the community.



FIG. 53.2. La Chaussée-Tirancourt (Somme, France): interior of late Neolithic *allée sépulcrale* showing burial layer V-3 with skeletal deposits in the central zone originally contained by wooden barriers leaving areas free of human remains against the chamber walls to left and right.

(Photo courtesy of Claude Masset).

MORTUARY PRACTICES AT UNCHAMBERED BARROWS AND ISOLATED GRAVES

In parts of eastern England, both intact bodies and disarticulated remains were laid out in groups on the earth or on chalk platforms and covered with a short low cairn and then an earthen long barrow, the resulting monument sharing the form of many long cairns. For

instance, at Giant's Hills 1, Lincolnshire, four corpses and the disarticulated remains from four other bodies were deposited in a single event between two posts towards the end of the rapid construction of a long barrow with wooden façade (Phillips 1936). A similar sequence is documented at nearby Giant's Hills 2, though only a bag of disarticulated bones was buried between the posts here (Evans and Simpson 1991). On the Yorkshire Wolds collective deposits were buried under round barrows from the second quarter of the fourth millennium BC, as at Towthorpe 18 and Wold Newton (Gibson and Bayliss 2010), whilst the split-post arrangement surrounding the collective burial below the round barrow at Callis Wold 275 and its façade trench indicate that such mortuary practices have much in common with unchambered longbarrows like Giant's Hills 1 and 2. Such sites suggest collective funerals, votive events, and/or special acts of containment or commemoration deploying the dead in various states of decay.

Some British single burials in graves date to the early fourth millennium, such as the crouched inhumation buried with pieces of a carinated bowl placed around the head at Yabsley Street, London (Coles et al. 2008), or the crouched inhumation of an adult female from Wormington Farm, Worcestershire (Darvill 2010, 137). At Nethercourt Farm, Kent, disarticulated bones were spread above a crouched inhumation covered with potsherds from an early Neolithic bowl, though it is unclear if there was one episode of burial or two (Dunning 1966, 8–11). A group of three burials at Barrow Hills, Oxfordshire, is among the largest collection of single graves (Barclay and Halpin 1999, 31–34). None of these were associated with barrows.

Single burial covered by a dedicated barrow or cairn was seemingly rare throughout Britain, Ireland, and northern France, and most examples probably date to the second half of the fourth millennium or first quarter of the third. There are three examples from the Peak District, though one burial (Grub Low) was accompanied by a set of cremated remains. At Alfriston in Sussex an oval barrow covered a single burial, yet its closest excavated comparator, Thickthorn Down in Dorset, covered only small 'empty' pits (Drewett 1975), again suggesting that burial was only one among several acts that could precipitate barrow-building. Deposition of burials at Duggleby Howe, Yorkshire, was as successive as deposition at some chambered tombs, though sporadic over the long term (Gibson and Bayliss 2009). Early deposits at the site (c. thirty-fourth century BC) include a single burial accompanied by a skull: both crania show signs of trauma, some perimortem. A burial accompanied by a curated antler macehead, arrowhead, and flint adze was buried c. 3300 BC, and a sequence of

single burials (the first adorned with or accompanied by twelve boar tusks, two beaver incisors and a bone pin, as well as associated with flintwork) followed only during the early third millennium when a large mound was raised over the burials (Gibson and Bayliss 2009). A flexed, crouched or contracted position was usual for mid to late-fourth millennium single burials—a pose also evident at many early to mid-fourth millennium chambers and unchambered barrows.

Single burial deposits of cremated bone are known in some areas during the later Neolithic and may be more widespread than previously realized, but tend to be recovered in cemetery groups. For instance, six deposits of cremated remains buried within two ring ditches in the Thames Valley have been dated to c. 3200–3000 BC (Barclay et al. 2009, 5–6). On the Isle of Man cremated bones were placed in timber ‘cists’ or in presumed organic bags at a natural mound at Killeaba c. 3000 BC (Cubbon 1978; Chiverrell et al. 1999), whilst one of the cremation deposits immediately outside the chambered cairn at Ballaharra c. 2900–2600 BC contained cremated and unburnt human remains from between 33 and 40 individuals alongside animal bones and artefacts (Cregeen 1978; Chiverrell et al. 1999; Fowler 2001; 2004b, 93–94). As with inhumations, we must ask why these specific remains were deposited in the earth and consider it likely that most cremated remains were scattered, not buried.

The formalized arrangement of single burials with specific types of objects, including Beaker pottery, between c. 2500 and 2200 BC suggest differentiation based on age and sex (Thomas 1991; Tuckwell 1975), and a few people were buried with distinctive and complex grave assemblages (e.g. the ‘Amesbury archer’: Fitzpatrick 2011). Whilst there is a distinctive grammar to single burials in Britain from this period onwards, the practice of burying the deceased crouched on one side had long been prevalent in Neolithic tombs and graves both here and elsewhere. The overall rate of burial was still relatively low, yet some burials cut into previous ones at the same locale (Mizoguchi 1993; Petersen 1972). Single burial was far from the only way to treat the dead in this period: cremation (e.g. at Stonehenge: Parker Pearson et al. 2009), dual and multiple burials in grave features (e.g. the ‘Boscombe bowmen’: Fitzpatrick 2011), disarticulation of bodies before deposition (Fitzpatrick 2011), and interference with buried remains have been identified. A similar range of practices are also evident in the following centuries of the early Bronze Age (Gibson 2007), when increased numbers of the dead were buried in graves or cists, and cremation before deposition increased as did the nucleation of burials into small cemeteries. In Ireland and in north-west France, Beakers accompanied bodies placed in chambered tombs of an earlier age, indicating that some of those places received renewed attention

at this period. The general pattern of terminal Neolithic, Chalcolithic or ‘early Beaker’ burial does not suggest a rise in personal aggrandizement or in presenting the extended biography of the dead so much as an idealized identity (see Vander Linden, this volume)—whilst the funeral *prior* to deposition may have attempted such effects the same is true for all Neolithic mortuary deposits.

MORTUARY STRUCTURES, THE DEAD AND ‘ANCESTORS’

[Barrett \(1988\)](#) argued that Neolithic tombs might serve a purpose in ancestral rites concerned with the bones of the dead rather than just funerary rites transforming the person after death. Whilst this fits some of the evidence from tombs, cairns, and barrows well, there is a clear need to differentiate between various mortuary practices at such sites—not all of which involved veneration of ‘ancestral’ remains in the same way, or even necessarily at all. Sometimes bodies were broken down in tombs and bones commingled or removed, sometimes not; sometimes human remains were accessible to later generations, sometimes not. The frequent citation of ‘ancestors’ in accounts of Neolithic societies has justifiably been criticized on the grounds that it has often been little more than an imprecise catch-all ([Whitley 2002](#)). The concept has been defended with the observation that ‘ancestors’ need not be genealogically connected to the living community ([Jones 2008](#), 192–193), and it is clear we need to be more searching and more precise in our discussion of how Neolithic people traced relationships between living and dead human beings and other entities in the social world, considering different models of ancestry and kinship to explain different Neolithic practices (cf. [Fowler 2004a](#), 101–129; [Jones 2008](#)). At the same time other motivations for entombing the remains of the dead must be considered in some cases, and applied to burials away from chambers. We have already drawn out some examples both of these other motivations (e.g. containing difficult deaths), and of specific ways that human kinship might be traced (e.g. by lineage or more communally). Here we consider the application of a generic concept of ancestral veneration in interpretations of mortuary sites.

Chronology and temporality are crucial to our understanding of the processes of construction and funerary deposition, and to the meanings that they may have held. The imprecision with which archaeologists can date the prehistoric past and model change at sites leads all too easily to monolithic interpretations (e.g. of ancestral veneration) and to the impression that changes in beliefs and practices were slow and gradual, but this is contested by cases where precise

radiocarbon dates are becoming available. Thus for instance the chambered and unchambered long barrows of southern Britain are now known to fall within a period of a few generations between the thirty-eighth and thirty-sixth centuries BC, and short event-like horizons have been proposed for the construction of other categories of chambered tomb in northern and western Europe (Bayliss and Whittle 2007; Scarre 2010). Some of the earliest chambers in Britain began as simple structures, sometimes built on the site of earlier activity. In some cases that activity was in the form of a setting of two or three split-trunk posts (see Noble 2006, 78–94). These post settings, also found under unchambered barrows, may have been part of shrines marking places that already had a history of religious value before the dead were buried there. Burial may have changed the significance of the locale. Impressive façades were built at many sites; either contemporaneously with the post settings or chamber, choreographing access to these, or later framing forecourts for gatherings outside chambers or at the front of mounds. Some chambered tombs were closed off and ceremonially put out of use. In northern France this process (known as ‘*condamnation*’) involved the destruction through burning of timber chambers (as in parts of Britain), or the partial demolition and levelling of a megalithic chamber such as La Chaussée-Tirancourt (Masset 1997, 151–152). In some cases, the addition of the mound may have marked the transformation of a funerary space into a monumentalized memorial. Where mounds accompanied or followed chambers or unchambered burials quickly, they may have commemorated known human individuals or families, possibly acknowledging them as ancestors, but in some instances several centuries intervened before monument closure or elaboration, and any concept of the ancestral dead is more likely to have been generic.

The dead may not always have been rapidly transformed into anonymous ancestors through funerary activity, but a cumulative effect of building structures to contain or cover the dead was to produce places associated with the ancestral dead. Ditch-digging and mound-building was not confined to mortuary sites, and during the same periods as earthen longbarrows were built, mounds transformed other historic places, such as post-defined cursus monuments in Scotland (Thomas 2006). Each of these monuments acknowledged the generative legacy of specific historically meaningful or perhaps now-mythical acts and events associated with the locales they monumentalized. Evidence for continuing veneration of these ‘ancestral’ sites is, however, equivocal, and it is possible that many sites were ignored or even shunned by subsequent generations following tomb closure or barrow construction. It is at present equally

difficult to interpret the extent to which ‘ancestral’ human remains were curated away from mortuary sites based on the occasional burial of a bundle of bones or skull, or the few known examples of stray bones at locales other than mortuary sites, caves or enclosures. It is also worth noting that ethnographies suggest that the bones (among other bodily substances) of the living and recently dead may also be identified as ancestral matter by the community (Fowler 2010, 13, 18). Thus, the possibility of Neolithic concepts of ancestry will remain an important challenge to interpret at a range of scales, and cannot be simply rejected nor repeated without specific scrutiny.

MORTUARY DEPOSITS AT ENCLOSURES

The deposition of human remains in enclosure ditches is a practice that can be documented at Bandkeramik sites in the late sixth millennium BC, Menneville in the Aisne valley being one of the most westerly examples of a widespread central European phenomenon (Farruggia et al. 1996; Hofmann and Orschiedt, this volume). Similar practices recurred in later millennia. In the chalk and limestone terrain of western France south of the Loire, for example, human remains, both isolated skeletal elements and complete formal burials, are frequently encountered at the base of the rock-cut ditches from the late fourth and third millennium BC. At Champ Durand there were five formal burials: three double, two single (Joussaume 2012). At Echiré, there were five formal burials in the outer ditch (two with skulls removed) and scattered human remains in the inner ditch (Burnez 1996). These deposits are consistent with a ceremonial rather than defensive interpretation for these enclosures (Scarre 1998).

Intact bodies were sometimes placed within the ditches of British earlier Neolithic causewayed enclosures (c. 3650–3350 BC). At The Trundle and Whitehawk, intact bodies were accompanied by incised chalk blocks (Curwen 1929, 1934). Intact burials have also been found at later enclosures in southern Britain. Two intact child burials had been inserted in niches cut within the ditch floor and covered by cairns of flint at Hambledon Hill (Mercer and Healy 2008). Four inhumations and a cremation deposit were placed in ditch segments at Flagstones c. 3300–3000 BC; the segments were backfilled and, a few years later, three were covered by large sarsen slabs (Healy 1997). At Monkton-up-Wimborne, Dorset, four people were interred together in a shaft at the centre of a pit-defined enclosure: a woman, her daughter, and two other children (Green 2000, 77–84). Some of the people buried intact at enclosures had died difficult deaths—in or just before childbirth for one of the Whitehawk burials, for instance, and

following the (presumably contemporary) death of several members of a family at Monkton-up-Wimbourne.

Skulls and isolated human skeletal elements were more common at causewayed enclosures, as at Hambledon Hill where cut marks and animal gnawing have been identified on some bones, whilst human skulls, lacking mandibles, were placed on the ditch floor (Mercer and Healy 2008). It is hard to say whether curation of heads was a form of ancestral veneration or whether these were trophies of violence (see Schulting and Wysocki 2005), and it is possible some heads or skulls moved between such categories (Fowler 2010, 8). Isolated bones, particularly skull fragments, have been found in some later Neolithic pits and henge ditches (Thomas 1996, 164–168), often late in the sequence of fills and sometimes associated with Grooved Ware sherds. For instance, human skull fragments have been found at the top of the ditch shafts of henges at Maumbury Rings and Wyke Down 1. Cremated remains have also been found at Stonehenge dating from c. 3000 BC (Parker Pearson et al. 2009).

MORTUARY DEPOSITION AT OTHER PLACES

Human remains were placed not only in contexts that we might readily classify as funerary or ceremonial in nature, but at other unmodified locales such as rivers, caves, and bogs. Thomas (1998) has argued that, as well as being buried, the remains of the dead were circulated through prescribed earlier Neolithic arenas such as causewayed enclosures and flint mines alongside other materials like flint and carved chalk objects within an ‘economy of substances’ (cf. Thomas 1996, 141–182). Thus, following death not all bodily essences were invested in tombs, and dispersal of remains into the landscape need not indicate a lower value for those persons or their remains.

Only one clear example of a deliberate burial has been found in a British flint mine (Cissbury Shaft VI), although a skull was found in the fill of pit 1 at Grime’s Graves (Barber et al. 1999, 62–63), and another shaft yielded a pick made from a human femur. Caves were used more frequently. Sheridan et al. (2008, 10, 17) provide radiocarbon dates from human remains in five Devon caves which all fall between c. 3900 and 3300 BC, whilst Dowd (2008) identifies a series of Neolithic burials from Irish caves. Leach (2008) outlines a range of early Neolithic mortuary practices within Yorkshire caves, pointing out that those whose bodies were left intact in these special places were effectively excluded from normal funerary treatment, and that several of them had serious pathologies. Middle and later Neolithic pottery has been found in caves yielding the remains of what

were probably intact bodies (Barnatt and Edmonds 2002). These British examples form part of a broad north-west European pattern of burials or isolated body parts from a wide range of contexts, many of which would not be considered primarily funerary in character (Pariat 2007).

REPRESENTATIONS OF THE HUMAN BODY AND METAPHORS FOR THE BODY

Figurative human representations were relatively rare. In the Paris basin a small but significant group of ceramic figurines is dated to the late fifth millennium BC, notably from the enclosures of Fort Harrouard and Noyen-sur-Seine (Mohen 1986; Mordant and Mordant 1986). The c. 15cm-tall clay bodies are naked and schematic, with accentuated sexual attributes (Scarre 2007, figs 2 and 3). The provision of socketed heads on some suggests they may originally have been clothed in some way. They were not deposited in a special or structured fashion and may have featured in the daily lives of household members; their meanings may have been contextual. Fragments of similar figurines have been found in the Auvergne and southern France.

A different set of fifth millennium human representations is found in northern France. In the north-west (Brittany and adjacent areas), an early series of standing stones (most subsequently incorporated into passage graves) carries a range of engraved motifs that may include schematic representations of the human figure (Scarre 2009). A classic contentious example is the so-called 'mother-goddess' motif from passage graves such as Ile Longue: a rectangular face or body, attached arms or ears, central crest or vestigial head, and wavy hair. 'Shouldered' slabs are mainly found built into megalithic tombs but may originally have been free-standing menhirs. The largest and most remarkable is the massive shouldered slab re-used as a floor stone around which chamber II of the Petit Mont cairn was built (Lecornec 1994). The identification of the human form is here based on overall shape rather than engraved motifs. Conversely, the slab re-used as a capstone in the Déhus passage grave on Guernsey is not anthropomorphic in shape, but engraved with an unequivocal human figure (Kinnes and Hibbs 1989). The evocative face and faintly carved belt and bow are without stylistic parallel in Neolithic north-west Europe.

Late in the fourth or early in the third millennium, human figures were carved in outline in the chalk-cut hypogea of the Marne, and pairs of breasts carved in relief on the late-series megalithic tombs of

the Paris basin and Brittany ([Scarre 2009](#)). In contrast to the earlier carved slabs, these stones had not been re-used but are *in situ*, an intentional part of the funerary space. They are also more overtly gendered. Yet only those of the Marne hypogea are complete human representations; the remainder are disembodied body parts, representing perhaps female-related concepts of nurturing and feeding, the transmission of vital essences. The free-standing Le Câtel menhir on Guernsey has clearly marked breasts, and may belong to the same tradition ([Shee Twohig 1981](#), 200; [Fig. 53.3](#)). A second stone of similar type, but reworked at a later period, comes from the adjacent parish of Saint Martin's whilst fragments of two further three-dimensional statue-menhirs have been found in Brittany ([Kinnes 1980](#)). Statue-menhirs also appear in southern France and the Alpine zone ([Scarre 2007](#)), but are entirely absent from Britain and Ireland despite the shared currency of megalithic architecture across north-west Europe.



FIG. 53.3. Le Câtel menhir, Guernsey. Granite statue-menhir of presumed late Neolithic date with shoulders, breasts and 'necklace' and a circlet around the

Few unambiguous representations of the human form have been recovered in Britain and Ireland. The early Neolithic ambiguous bone ‘god dolly’ from the Haddenham enclosure may represent a human form (Pollard in [Evans and Hodder 2006](#), 307–308), and there are two wooden figurines: one from the Somerset levels near features dating to between 3040 and 2450 BC, and one from Dagenham dating to the terminal Neolithic/Chalcolithic or start of the early Bronze Age ([Scarre 2007](#)). It is notable that these did not use the most enduring media: only on Orkney have stone or clay figurines been found, notably the two figures in stone and one in clay from in or around late Neolithic buildings at the Links of Noltland ([Varndell 2012](#), fig. 53.4). Miniatures of bodies provide an opportunity to observe phenomena at a smaller scale, to create an easily manipulated microcosm and thereby reflect on the body in a particular way. North-west European communities might have manipulated scale in different ways to those of south-east Europe; in north-west Europe, where monuments constituted microcosms, scaling key principles down so that human beings could relate to them bodily in a single space at a single time, there may have been less need to miniaturize the body. Alternatively, these communities may have used more ephemeral media to depict bodies.

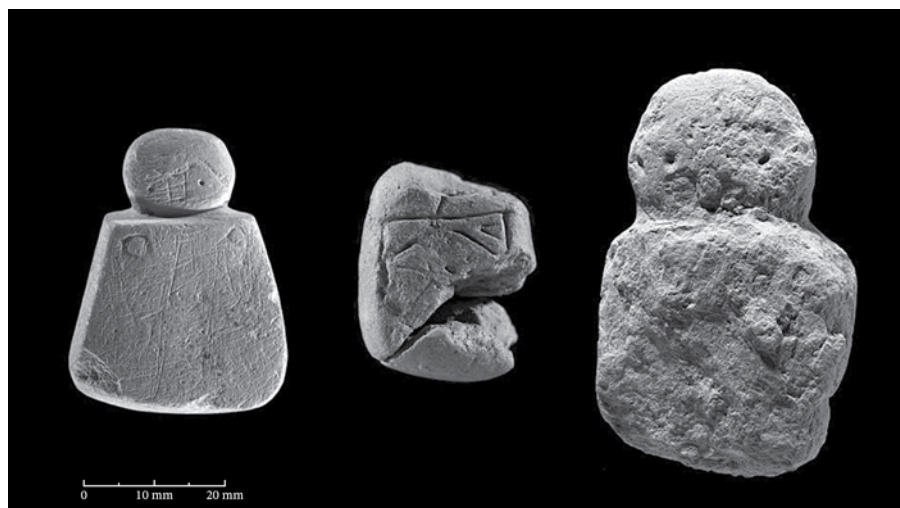


FIG. 53.4. Three figurines from the Links of Noltland, Westray, Orkney. Scale length 2cm. The middle figurine is made of clay.

In contrast to intact bodies, body parts were represented in a variety of media (Thomas 2005). In later Neolithic Britain, schematic faces were carved on the drum-like chalk objects from Folkton in Yorkshire, and further possible faces appear on the macehead from Knowth and on a sandstone plaque from Rothley Lodge Park in Leicestershire. In northern France and southern Britain, there seems to have been a focus on the organs used in the transmission of vital substances. Paired female breasts are carved on tomb walls in Brittany and the Paris basin. Stone or clay balls and phalli have been found at mines, causewayed enclosures, and henge monuments in southern Britain. Teather (2008, 266) reports 22 phalli from southern Britain of which 12 are chalk, eight flint, one bone, one clay, and one iron pyrite. If they refer to body parts, such balls may represent testes, breasts, or heads. Other ambiguous objects may also have referred to body parts: mushroom-headed bone pins recovered from Irish passage graves which often also contained stone, chalk or limestone balls, such as the Mound of the Hostages, may perhaps have been phallic referents.

We might also compare human bodies with other material ‘bodies’ and consider whether Neolithic people saw the same principles manifested in these bodies and in human bodies. Human bodies can be understood as composed of the substances passed on by the generations that went before—containing vital essences transmitted down lines of descent—and/or as renewed by ongoing interaction with other spiritual beings (Fowler 2004a, 101–129; Jones 2008, 192–193). In many belief systems such generative forces are also invested in a range of worldly materials, places, objects, plants, and animals. Detailed contextual analyses have considered the media of the Neolithic world as metaphors for or equivalents to the human body or its constituent parts and substances: pottery vessels (Fowler 2001, 2004b, 2008; Thomas 2002); stone, quartz, flint, and pitchstone (Fowler and Cummings 2003; Jones 1999; Parker Pearson and Ramilisonina 1998); plants, trees, and wood (Cummings and Whittle 2004; Fowler 2003; Noble 2006; Parker Pearson and Ramilisonina 1998); axes (Thomas 1996); and animal bodies, especially cattle (e.g. Jones 1998; Ray and Thomas 2003). Tombs, cairns, and barrows can be seen as embodiments of a community: the social body at a large and enduring scale (Fowler 2004b, 2008; Fowler and Cummings 2003). Bodies, objects, places, and structures were sometimes subject to comparable cycles of generation, transformation, and destruction followed by the manipulation of their fragmented substances. Like more figurative representations, each medium could have provided a different way to reflect on human bodies. Moreover, human persons do not only interact with human ancestors and peers: vital and generative relations with other entities—persons, spirits, and other

beings—may have been negotiated in many ways, some involving human remains. Communities might trace their ancestry in relation to human progenitors, animals, trees, or mountains with whom they shared a mythical origin. Thus, understanding Neolithic bodies requires a move beyond art that literally represents the body and beyond the bodies themselves to explore the wider media through which bodies were generated, experienced, and reflected upon.

DISCUSSION

The diversity in mortuary practices and bodily representations outlined in this chapter may relate to varied ways of conceptualizing and categorizing bodies, persons, communities, ways of dying; to different religious beliefs and ritual practices; and to varied and changing relationships among the living and between the living and the dead. New chronologies for mortuary sites and new analyses of human remains will increasingly allow us to discern historical junctures when specific ways of treating bodies and relating to the dead came to the fore, and to start to build a picture of the daily routines that shaped Neolithic bodies (e.g. [Wysocki and Whittle 2000](#)).

Some broad trends in treating the dead emerge from the diversity of specific regional and historical patterns. Whilst bodies were sometimes presented as an ornamented image following death, or engraved in stone, they were often represented ambiguously, in pieces, in process, in transformation. Throughout most of the Neolithic in north-west Europe, the intact, fleshed body was seldom represented. Instead (in twenty-first century terms), *real* bodies and their parts were presented directly in daily routines, ceremonial interactions, acts of excavation, construction, and deposition. In most cases burial of human remains was rare, and perhaps derived more from very specific ideas about particular people, events, or places than from normative funerary traditions extended to all. Where bodies were placed in single graves, relations were arguably traced through the artefacts in the grave, location near others in a cemetery—the growth of which involved tracing relations across generations—and/or choice of place for burial. But some single burials were left isolated and with little or no objects. The increased frequency of single burials in the Beaker period may indicate the emergence of a new understanding of what burial meant, bringing about new categories of the dead.

Single-event collective interments or entombments perhaps held votive significance and/or dealt with difficult deaths or the deaths of unusual persons. Where bodies were placed in chambers in close

proximity with those of others recently deceased, including through successive single deposition in tombs, these people were defined as sharing close relationships and forming a community. The mixing of bones from different bodies within tombs might mark affinities or intermarriages between people from different moieties or lineages (Fowler 2001; Lucas 1996; Richards 1988; Sharples 1985). Many tombs provided such opportunities for manipulating the long-dead, but at some point most tombs were closed, abandoned, or even burnt down.

In Ireland, children were seldom treated to the funerary rites of adults, and rarely cremated. This suggests that children were different categories of persons—perhaps, as in some contemporary communities, closer to the ancestors and thus less in need of dramatic purification and transformation. Categorical distinctions between children and adults may have been more widespread. It is hard to gauge the extent of some practices, such as exposure to carnivorous animals or the curation or circulation of human remains (whether in venerating loved ones or ancestors or as trophies of violence and/or the result of religiously—or emotionally—motivated head-hunting), though we can discern how often such practices preceded the deposition of bones. Most bodies were probably dissolved into the broader landscape, perhaps left for animals or cremated and scattered. Corpses and bones were arguably manipulated in mourning and transforming the dead, and in tracing and transforming social relations, including, in some cases, with the ancestral dead. As distinctive enduring parts of the person that could only be extracted following death, bones were sometimes key material media of social relations. Some bodies and bones had to be stored or disposed of with special care. The retention of body parts may have had various effects and significances within complex value-systems, from the violence of killing and trophy-taking to the reverence of a sacred relic.

This chapter has dwelt on relations with the dead, but others have attempted to consider other Neolithic embodied experiences—at pre-existing monuments (e.g. Thomas 1993; Richards 1993; Tilley 1994), or during the construction of earthen barrows and stone long cairns (McFadyen 2007; Richards 2004). Some have discussed the comparative effects of different ways of treating the dead (e.g. Fowler 2003, 2004a, 2004b; Harris 2006), but there is more to be said about the evocative impact of leaving bodies to decay (or become partly preserved) in tombs, cremating a corpse and gathering the remains, collecting the remains of a corpse exposed to wild animals, disarticulating, or burying a decaying body. Where personal objects did not accompany the dead, we have to ask where they ended up and what roles they played in funerary rites and/or in extending

personhood and commemorating the dead. To make further sense of Neolithic bodies and persons it is necessary to contextualize mortuary evidence alongside the routines of daily life (Jones 2005). Marrying improved information about occupation sites with that from mortuary deposits will be crucial in that endeavour.

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PART IV

CONCLUSION: DEBATES IN NEOLITHIC ARCHAEOLOGY

CHAPTER 54

UNEXPECTED HISTORIES? SOUTH-EAST AND CENTRAL EUROPE

ALASDAIR WHITTLE

My brief here is to take an overview of both south-east and central Europe, and anyone familiar with the wealth of evidence now at our disposal for these areas, established by research traditions going back to the later nineteenth century, may feel that is an impossible task for a short concluding chapter. The rationale of handbooks, after all, is to assemble, as here, an array of experts to provide a detailed sense of the latest specialist knowledge on any given topic. The genre tends, however, to some degree of fragmentation and also compression, so some wider reflections, connections, and predictions may be of value. Since I cannot possibly cover everything, I want to direct those to four connected themes: beginnings; the character of settlement and agricultural economy; the nature of society; and the kinds of Neolithic history that we can now attempt to write. The reader will have to forgive me for using my own previous, solo attempt at a continent-wide synthesis ([Whittle 1996a](#)), which I started writing exactly 20 years ago, as a personal point of reference. Some of what I claimed then has not stood the test of time, but other interpretations may remain useful, and new perspectives and possibilities have certainly emerged. Far beyond my own work, this handbook celebrates research on the Neolithic of Europe that continues to be dynamic, innovative, and creative.

BEGINNINGS

The Neolithic process was one of the great transformations in human history. At about 7000 BC,¹ there were no farmers in Europe, but by soon after 4000 BC there were very few hunter-gatherers left, mainly in the north. The adoption of more settled existence and of agriculture led in the long run to bigger populations, more differentiated social relations, and very different worldviews compared to those of hunter-

gatherers, all in their various ways ultimately laying the basis for much of the modern world. That said, it is easy enough to confuse what things became with how they started, and there has been some tendency to over-emphasize the importance of the perennial debate about beginnings, and to take subsequent developments somewhat for granted. It is valuable therefore to reflect on the state of the debate about beginnings.

The favourite model in research on both south-east and central Europe has long been that of colonization. In my previous survey, I challenged that for both areas, though perhaps more tentatively for south-east than for central Europe. Why could we not envisage indigenous people being much more centrally involved in the processes of transformation, bringing their own demonstrable knowledge of local landscapes and resources, and applying their presumed resourcefulness and adaptability to changing conditions and opportunities ([Whittle 1996a](#))? I was not the first to suggest this kind of view, and one can find it in some of the mid-twentieth century literature on central Europe (surveyed in [Bickle and Whittle 2013a](#)). This now seems too extreme a view, and for central Europe at least I would now prefer a fusion or integration model in which both indigenous people and incomers were involved ([Whittle 2003](#); [Whittle and Bickle 2013](#); [Zvelebil 2004](#); [Zvelebil et al. 2010](#)). Here and in south-east Europe, the arguments for incomers remain strong, but it is worth stressing that the situation may not be the same everywhere.

In Greece and the Balkans, the apparent scarcity and regional fragmentation of post-glacial hunter-gatherer populations remain powerful arguments in favour of incomers. New research can be successful in filling in some of the gaps in Mesolithic presences, shown for example by new survey and excavation in western Hungary ([Eichmann et al. 2010](#)), but the overall distribution of hunter-gatherers remains stubbornly low. That can then be contrasted strongly with the apparent abundance of early Neolithic settlements in both northern Greece (as seen not only in Thessaly, where 120 known settlements by 6200 BC have been quoted ([Anthony 2010a](#), 33), but also in a string of new discoveries in Macedonia and Thrace) and parts of southern and central Bulgaria, and in due course at points north up to the Great Hungarian Plain. The adoption of novel resources in the form of cereal cultivation and animal husbandry, neither with local, European forms, and the whole abundance of the material frame of Neolithic existence, from the architecture of houses to the repertoires of pottery, other fired clay objects including figurines, stone tools, and the rest, further support this interpretation.

Two notes of caution are in order, however. The first concerns one version of that tendency, already noted above, to elide transition with

development. Many of these arguments have been applied in the south to a rather imprecisely defined timespan straddling the middle and later part of the seventh millennium BC (with the Körös culture of eastern Hungary appearing from about 6000 BC: [Whittle et al. 2002](#)). Given our ability now to define radiocarbon timescales with much more confidence, which I develop below, I would want to see future research unpicking trajectories of initiation and first development with much more precision. Do many settlements begin all at once, implying large-scale colonization, or do they increase through time, slowly or quickly, implying different kinds of local growth? These are not identical scenarios, and a more gradual rate of increase might let the case for indigenous involvement back in, to some extent. Not for the first time, researchers have been too content with fuzzy chronologies.

Second, if colonization into Greece and the Balkans was the main process, we are still far from understanding it in any detail. That research on western and north-west Anatolia and on European Turkey has improved radically compared to 20 or 30 years ago ([Özdoğan 2008, 2010](#); [Çilingiroğlu 2012](#)) has helped, but it also serves to highlight some of the problems. Western Anatolia seems to have a different material tradition compared to what is found in Greece and the southern Balkans, and so does not seem a likely source. North-west Anatolia may suggest now a more gradual series of developments, but the monochrome pottery of the Fikirtepe culture does not appear to be an immediate predecessor for the red-painted wares of Thessaly and southern and central Bulgaria ([Özdoğan 2008](#)). In general, it is easy to agree with the claim for an ‘unorganized movement’ or some kind of ‘infiltration’ ([Özdoğan 2010](#), 890), but whether this was by land from central Anatolia or even south-east Anatolia, or even directly by boats from there and points south ([Perlès 2001](#)), remains quite unclear. Many of these kinds of narrative are still constructed around pottery, and attention needs to be given to ‘frontier’ conditions on the ground in novel situations ([Kotsakis 2005](#); [Borić 2005](#)).

The situation in central Europe is rather different. Roughly from the bend of the Danube northwards, Mesolithic presence is much more visible and much better documented ([Mateiciucová 2008](#)), though in turn more abundant still in northern and western Europe. Though not all specialists agree (e.g. [Kozłowski and Raczyk 2010](#)), there are good arguments for seeing continuities in both lithic technology and lithic distribution patterns through the transition from the late Mesolithic to the emergence of the LBK, in the middle of the sixth millennium BC ([Mateiciucová 2008](#)). Whilst it is conventionally understood as ending by c. 5300 BC, the earliest phase of the Linearbandkeramik (LBK) appears to continue into the fifty-third century BC ([Pettitt and Hedges](#)

2008), giving plenty of time for more gradual development than often modelled. Many researchers currently prefer Transdanubia or western Hungary as the principal source area for the emergence of the LBK (Bánffy 2013), though there are still far fewer Starčevo settlements in that area, despite the success of recent research, than there are Körös culture settlements on the Great Hungarian Plain. If correct, such a source would also allow a gradualist model of earliest LBK development. Finally, earliest LBK animal husbandry appears to have been quite varied, and although earliest LBK timber longhouses are radically different to anything that came before in the local Mesolithic context, nor are they much like their Starčevo or Körös precedents (Lenneis 1997).

Those are some of the arguments for an at least greater involvement by indigenous populations in the emergence of the LBK in central Europe, compared with the appearance of the early Neolithic in south-east Europe. What is new is the growing number of studies of ancient DNA. Previous inferences from modern DNA patterns had suggested a possible scenario of relatively low numbers of incomers and a much greater input from Palaeolithic and Mesolithic lines of descent (e.g. Richards et al. 1996); a limited aDNA pilot study of the earliest LBK cemetery of Vedrovice, in Moravia, conformed to that pattern, and isotopic studies there also suggested a variety of life histories, with people buried there having been born both locally and further afield (Zvelebil and Pettitt 2008). In the past few years, however, successful extraction and analysis of aDNA not only from animals (e.g. Bollongino and Burger 2010; Larson et al. 2007) but also from humans has suggested marked genetic difference between Mesolithic and early Neolithic populations in central Europe, and the likelihood of strong Near Eastern inputs into both female and male lines of descent (e.g. from a burgeoning literature, Haak et al. 2005, 2010; Bramanti et al. 2009; Balaesque et al. 2010; Brandt et al. 2013, 2014; Szécsényi-Nagy et al. 2014).

This is a highly important development, and it is a pity that this handbook does not report it more fully. Caution is again appropriate at this stage of research. To my knowledge such studies have not yet extended south of the Carpathian basin, and there may be issues of preservation in more southerly contexts; obviously it will be a truncated and partial narrative if south-east Europe cannot ultimately be included. The numbers of analyses remain at this stage very low; we have to take into account later changes; and without finer chronological resolution and a clearer baseline with which to approach central Europe, an absolute distinction between incoming Neolithic and indigenous Mesolithic populations could be positively misleading (Deguilloux et al. 2012). We need to combine both sets of

evidence, genetic and archaeological, into insightful new models. One recent critical review proposes ‘lineages brought by the agriculturalists from Anatolia, mixed with lineages from assimilated Balkan foraging populations’, and ‘the migration of pioneer Neolithic groups in central Europe ... followed by admixture with indigenous hunter-gatherers combined with hunter-gatherer groups’ acculturation, eventually leading to hunter-gatherers outnumbering the original Neolithic migrants’ (Deguilloux et al. 2012, 32). That kind of general scenario may have been played out with plenty of variation from region to region and phase to phase. The initial apparent uniformity of LBK culture may be in part to do with its role of integrating people of varying descent and history (Robb and Miracle 2007; Whittle and Bickle 2013). The business of getting on together is a key theme from the start.

LIFESTYLES AND PRODUCTION: THE CHARACTER OF SETTLEMENT AND AGRICULTURAL ECONOMY

That Neolithic people built houses, often impressively large and numerous, and that they grew crops of cereals and other plants and kept herds and flocks of cattle, sheep, goats, and pigs, has long been evident. But how did they live, and what were the goals and scales of their agricultural production? The easy assumption, long made in European Neolithic research, was that farming drove everything; people were farmers, so naturally they settled down and led sedentary lives, and since they were not on the move like hunter-gatherer predecessors, they naturally had houses. Research in the Near East shows that people began to settle down before they had domesticated animals and plants (Watkins 2010), so the assumed links between agriculture and sedentism may be more complicated than often envisaged. In my previous synthesis, and drawing on debates in Britain in the 1980s and 1990s, I suggested that many people’s lives in the European Neolithic may have been more mobile than commonly assumed; herding over considerable ranges could have been a recurrent activity, and some agriculture at least short-term and opportunistic; places with houses may often have been special locations for assembly and the creation of communal identity (Whittle 1996a). Quite a lot of that was wrong, and we should emphasize the process of settling down in south-east and central Europe, and acknowledge the powerful ‘garden’ model for intensive, long-term agriculture (Bogaard 2004, 2012; Halstead 2005; Bogaard and Halstead, this volume). The importance of cereal cultivation appears to be further supported by ongoing research into manuring practices

(from isotopic analysis of cereal remains themselves: [Bogaard et al. 2013](#)), and the case has been well made here ([Bogaard and Halstead](#), this volume) for relatively small-scale animal husbandry in early stages of the Neolithic in Greece and the Balkans. Isotopic analysis of both humans and animals has been developed considerably in recent years, and applied mainly to the LBK (e.g. [Price et al. 2001](#); [Knipper 2011](#); [Bickle and Whittle 2013b](#); [Schulting](#), this volume). Results show over and over again, just as at Vedrovice, mentioned above, a mixture of people being buried in the locality where they were probably born and others who had begun their lives elsewhere, but lives lived locally are in the majority. One of the most detailed studies of animals, in the LBK of south-west Germany, suggests a complicated pattern of movement, but in different parts of the landscape around and mainly within easy reach of known settlements ([Knipper 2011](#)). That need not exclude some longer-range herding, but as a recurrent strategy, that may often belong to later times.

So different strands of research over the past two decades have served to underpin several traditional assumptions, and to begin to give detailed insight into how lives were led. Yet many questions remain. Take houses first. We must still acknowledge the diversity of regional sequences and architectural practice. In some areas, houses are prominent from the outset, whilst in others they emerge more gradually. Some houses are quite modest one- or two-roomed houses, and in some settings, as in northern Greece, the outdoor spaces between houses seem at least as important as the buildings themselves ([Halstead 1999](#)); other structures, as classically in many LBK settlements, can reach striking lengths of 30m and more ([Coudart](#), this volume). In some settings, it was important for the house to be repeated on the same spot, producing what we recognize as tells ([Raczky](#), this volume), whilst in other, ‘flat’ settlements, a different spatial order must have prevailed; larger-scale excavations and geophysical surveys have given several examples of contemporary combinations of vertical tell and surrounding flat settlement, and there is good evidence now for differential layout and activities in these respective zones. It is clear that the house is a powerful symbol, both reflective of social and cultural practice and a means by which that was created ([Whittle 1996b](#); [Bailey 2005](#); [Hofmann and Smyth 2013](#)), rather than simply a practical shelter for people who needed a roof over their heads most of the time. The house belonged to particular social settings, rather than universal logic; that can be seen in the horizons in both south-east and central Europe from the later fifth millennium BC onwards, when houses were not built any longer in the same numbers as before (or with the same visibility); I will come back to this below. We do not really know what constituted the

Neolithic household, and it may not have been confined to single buildings (Souvatzi 2008). The duration of houses may have varied considerably, but this needs much more research. Surprisingly short use-lives are shown in the Alpine foreland (Ebersbach 2013; Menotti, this volume; Pétrequin 2013); enduring permanence of buildings there was clearly not valued (Hofmann 2013). The conventionally modelled duration for LBK longhouses is around 25 to 30 years, though much longer use-lives have been suggested recently (Rück 2009); if the normal estimate is correct, this cannot be driven by practical logic, since big oak posts would last far longer, but presumably by social conventions (perhaps to do with marriage, the death of household heads, and so on). We do not really know yet in any detail, on a generational timescale, the duration of houses in tells and flat settlements in south-east Europe: another important goal for future research. The occupation of the Körös culture site of Ecsegfalva 23 on the Great Hungarian Plain, estimated in a Bayesian framework (see below) at 70 to 80 years long, must have included more than one building phase (Whittle 2007). In these and other ways, instead of a simplistic dichotomy between permanence and mobility, a much more complex series of questions has emerged about households, community, membership, social logic, and symbolism.

We need to keep the house firmly in its social context. If we accept the models of garden cultivation and small-scale animal keeping in early stages of the Neolithic in south-east Europe (which worked well at Ecsegfalva: Bogaard et al. 2007; Bartosiewicz 2007), how did this operate in detail? Did house equate to household, and were all houses the same? And what changes in the sphere of production can be seen through time? Was agriculture the motor of continuing Neolithic development?

Two of the most revealing studies so far for the detail of agricultural production at a community level have come from the LBK. The practices of the LBK are often modelled as very uniform, though close analysis can reveal surprising diversity (Modderman 1988; Bickle and Whittle 2013b). Although it could be potentially misleading to base interpretations of recurrent practice on just two studies, both provide very revealing insights which could inspire much further research. The first, Vaihingen in south-west Germany, informs on the organization of cereal production within an LBK community (Bogaard et al. 2011; Bogaard 2012). The site is a large concentration of longhouses, enclosed by a ditch and palisade in its initial phases. In other LBK settlements, the longhouse has often been modelled as existing in its own space or 'yard', but here the houses seem closer set. Analysis of decorative motifs on the pottery suggests a series of six groupings of adjacent houses, here dubbed 'clans' (and elsewhere 'wards'). The

excavations were accompanied by unusually extensive recovery of charred plant remains, and differential patterns of cereal remains and especially weed species mapped surprisingly well on to the ceramic distributions. Cutting a long story short, the interpretation is of varying access to land and soils of differing quality around the site (Bogaard et al. 2011). It is not clear if households operated on their own within the putative clan or ward organization, but there is striking evidence for difference within the community. This is further borne out by the varying history of the clans or wards; one or two of those with what is interpreted as access to land of poorer quality may have come to an end before the more successful ones, and the people in question might even at that point have migrated elsewhere (Bogaard et al. 2011, 408).

For the second LBK study, I must go beyond the area of my brief, to bring in Cuiry-lès-Chaudardes, in the Aisne valley of northern France. This was an area where LBK settlement began towards the end of the sixth millennium BC. Excavations since the 1960s have revealed a series of settlements along the terraces of the river; Cuiry stands out as one of the largest and longest-lived, with a mixture of larger and smaller longhouses, the latter more often on the periphery of the settlement (Ilett 2012). Animal bone preservation is variable across the LBK distribution; here it is very good. Once again, a surprisingly differentiated picture has emerged (Hachem 2011). In essence, the animal bones found in the borrow pits beside the larger and more centrally placed longhouses have much higher proportions of cattle and sheep, whilst the assemblages associated with the smaller, mainly peripheral houses are dominated by wild game such as deer and boar. We do not know the duration of individual houses, nor of the different phases detectable at this site; nor are we sure whether the deposits in question belonged to the founding of buildings or accumulated during their use (Hachem 2011). In any case, what is significant here is the evidence for difference, whether it speaks for specialization (herders and hunters), household totems or other signifiers, or household success (in the Aisne valley, larger houses are more generally associated with the larger sites).

We do not yet have the detail for animal husbandry at Vaihingen, nor of plant use for Cuiry-lès-Chaudardes, but a more integrated picture, also showing difference within a single settlement, is seen in the later fourth millennium BC at Arbon Bleiche 3 on the Bodensee (Jacomet et al. 2005; Menotti, this volume). We tend only to have summary pictures of subsistence practices for the tells and large flat settlements of south-east Europe. There are preliminary reports of a predominance of wild animal remains on the tell at Csőszhalom-Polgár in northern Hungary, contrasting with the domesticates found in the

surrounding large, flat settlement (Raczky and Anders 2008; Raczky, this volume). But what differences were there within the flat settlement, here and elsewhere? How were the very large settlements of the later sixth to the earlier fifth millennium cal BC in south-east Europe supported? More generally, what changed through time in the sphere of agricultural production, and what was the rate and character of change?

These are hard questions to answer, and serve to define goals for future research, and to frame recovery strategies in excavations of all kinds. One change may be in the scale of animal keeping. The case of Okolište, Bosnia, is useful (Müller, this volume; Müller et al. 2013), since it is a large settlement in a confined basin, where the setting suggests the necessity to have kept animals elsewhere. The probable example of large-scale feasting on cattle has been highlighted for a sixth-millennium episode at Makriyalos in northern Greece (Pappa et al. 2004; Bogaard and Halstead, this volume). Although sheep and goats were the favoured animals of the early stages of the Neolithic in south-east Europe, that did not last, and with time cattle became much more prominent generally; the same holds true within the LBK as a whole. The shift to cattle in the LBK has been connected to the changing environment, wetter and more wooded, as one goes further into central and western Europe, but since the same shift is found further south, I believe that this was conditioned principally by social factors. In the LBK context, houses and wards did not exist on their own; they were part of neighbourhoods and other social networks. Cattle may have begun to be kept in their own right as signifiers of prowess and success; studies of LBK assemblages in central Poland also show probable use of cattle for feasting, contrasting with the treatment of sheep and pigs in what appear to be more routine settings (Marciniak 2005). Keeping large houses and large settlements going required social connections and obligations to be satisfied; large-scale sharing of food, presented on and enhanced by arrays of decorated pottery (Halstead 1999), was probably one of the principal ways in which this was achieved. Study of animal bone assemblages in the Vinča culture of Serbia and surrounds, in the later sixth into the first half of the fifth millennium BC, may tell much the same story (Orton 2010).

That still leaves many questions about how larger settlements were supported on a regular basis. There is much work to be done on the detail of daily lives, house by house, and ward by ward. We could look forward to wider studies applying isotopic analysis of diet and lifetime movement to the burial record of south-east Europe, including from the numerous cemeteries (Borić, this volume), and to further faunal assemblages (e.g. Balasse et al. 2012); perhaps further advances

in genetic analysis would enable further insight into the history, composition, and exchange of herds and flocks in any given region. There is surely scope for exploiting pollen from old river meanders and other deposits close to settlements large and small.

Not that long ago, questions about subsistence change through time might have been answered with reference to the idea of the ‘secondary products revolution’, in which traction (for wheel and plough), milking, wool, alcohol, and even drugs were supposedly prominent innovations from the south-east from the fourth millennium BC onwards (Sherratt 1981, 1987, 1991). The picture now, however, is much more varied (Marciniak 2011). Perhaps only the wheel still definitely belongs to the fourth millennium BC (Schier, this volume); its importance is not to be under-estimated, if only for the possibility that it facilitated mundane but vital tasks such as shifting manure. The evidence for the use of dairy products has gone much earlier, into the early Neolithic in at least parts of south-east Europe (Craig et al. 2005; Evershed et al. 2008), and now in parts of the LBK distribution in central Europe (Salque et al. 2012). There are unresolved questions about the development of lactose tolerance in the human populations concerned (Itan et al. 2009), but there is enormous scope for further research on both the initial and subsequent stages of development (Richard Evershed, pers. comm.). The evidence for the introduction of the plough remains ambiguous, and its place in garden systems unclear. Did gardens or more extensive cultivation, or both, support the major settlements of south-east Europe? Whatever the resolution of these individual issues may be, there is no clear signal at present for marked intensification of the agricultural system through time. That is a puzzle, given the large numbers of people that seem to build up in given situations (the developed LBK; the later Lengyel and Vinča cultures; and widely in other parts of south-east Europe by the fifth-millennium BC). It could also be part of an explanation of possible cycles of demographic growth and apparent collapse, themselves another avenue for fruitful future research (e.g. Shennan 2009). I will come back to this below.

COMMUNITY AND SOCIETY: CONNECTIONS AND DIFFERENCE

What was Neolithic society like? The dominant tendencies in interpretation have been to seek and find differences in social position within any given community, and to see an intensification in social differentiation through time; by later in the Neolithic, people are seen as living in webs of more hierarchical social relations than their

predecessors. Agriculture and settling down become connected to a steady increase in the concentration of power in fewer hands. Spectacular discoveries such as the most abundantly furnished graves in the mid-fifth millennium BC cemetery at Varna on the Black Sea coast of Bulgaria, with their rich arrays of gold and copper ([Ivanov 1988](#); [Renfrew 1978](#); [Chapman 2013](#); [this volume](#)), are harnessed to this narrative, which alongside the debate on beginnings tends to dominate Neolithic studies as a whole. There are many problems with this kind of account, which I still think distorts the nature of Neolithic history. First, there is the question of how to characterize social relations in any one context, and then there is the uncomfortable observation that things did not steadily intensify as time passes. Social relations in the fourth millennium were not demonstrably more hierarchical than in the fifth millennium (though they need not have been identical), and even by the earlier third millennium BC in the Corded Ware orbit, there is a sort of formalized simplicity to strongly gendered relations within family and other descent groups. Profound changes in settlement and material culture in south-east Europe from the later fifth millennium BC ([Anthony 2010a, 2010b](#)) raise the possibility of a series of interruptions and innovations from the outside—from the east—but they also set difficult questions of cause and effect. If there were eastern incomers at this stage ([Gimbutas 1991](#); [Mallory 1989](#); [Anthony 2010a, 2010b](#)), were they instigators of change, or did they merely take advantage of radically altered circumstances? This is another part of the unexpected histories of Neolithic Europe.

I have probably been guilty of excessively ‘flattening the hierarchy’ in my previous interpretations ([Whittle 1996a](#)). Beyond the area of my brief for this chapter, the speed and range of changes now detectable within the early Neolithic sequence in southern Britain certainly encourage us to think of a social dynamic based on emulation, competition, and probable increase in numbers of people on the ground ([Whittle et al. 2011](#)). These central questions deserve another book in their own right, so here I want simply to try to identify some of the key components of the argument.

We are not short of candidates for signifiers of social difference. Many of these belong to horizons after the first appearance of the Neolithic. Even for the initial spread of the LBK, however, it has been suggested that it was lineage competition that drove colonization ([Friedrich 2005](#)). Inherited social position, seen in the burial of children with numerous or special grave goods, has been claimed for both part of the LBK in the later sixth millennium BC and in some of the Lengyel culture cemeteries of western Hungary in the earlier fifth millennium ([Jeunesse 1997](#); [Zalai-Gaál 2010](#)). Large houses, and large

settlements, have both been claimed as markers of preeminent social position in LBK community (e.g. [Pechtl 2009](#); [Petrasch 2003](#)); and subtle differences in access to land and soils have already been noted in the study of LBK Vaihingen ([Bogaard et al. 2011](#)). The production and possession of unusual, desirable or otherwise rare and exotic artefacts, such as in copper, gold and jadeitite, have also regularly been linked to themes of social difference, broadly from the fifth millennium onwards ([Chapman 2013](#)). As well as simply differences in size, subtler aspects of prominent settlements or places have also been linked to themes of social difference. Control of time and the past has been argued to be at the heart of the emergence of tells on the Great Hungarian Plain as ‘arenas of social power’ ([Chapman 1997](#)), and special ritual knowledge could have been behind the emergence of the great tell of Vinča-Belo Brdo itself ([Chapman 2000](#), ch. 6). The list of individual cases could go on, but it is clear that social difference has been sought in a range of factors, which we can note tend often to vary from case to case, but which include access to land, control of labour, an ability to accrue possessions, prowess in gift exchange, secret ritual knowledge, and domination of systems of descent.

On the other hand, it seems likely that most if not all Neolithic people and groups had potentially equal access to the means of production. In the case of Vaihingen, it is variation in the local landscape of fertile loess soils that is at issue. Perhaps a key means of establishing difference lay in the ability of households or other social groupings to mobilize labour and allies. It also seems likely that most if not all Neolithic people and groups had equal access to the means of self-defence. It is certainly true that the evidence for inter-personal and inter-group conflict and violence has improved markedly over the past two decades of research (e.g. [Schulting and Fibiger 2012](#)), another theme that could have figured more prominently in this handbook. Generalizing, alongside the occasional episodes of dramatic inter-group violence, such as in the late LBK cases of Talheim and Asparn, and the still unexplained and remarkable instance of ritualized dismemberment and even cannibalism at Herxheim ([Boulestin et al. 2009](#)), also in the late LBK, the picture seems to be of endemic but fluctuating inter-personal violence, leaving a legacy of healed and unhealed wounds. Could some of the larger and more nucleated settlements, for example in the LBK or in fifth-millennium south-east Europe, be a response to the threat of violence, on analogy with situations in North America ([Bandy and Fox 2010](#))? Could some of the variously ditched, palisaded, and banked enclosures of the later fifth into the fourth millennium BC in central Europe (and westwards) also be a response to the threat or reality of violence? The case of extensive burning of houses at Okolište, Bosnia, can be noted ([Müller](#),

this volume; Müller et al. 2013), and there may be others, including Uivar in western Romania (Draşovean and Schier 2010), but by and large so far there is no compelling evidence for the universal burning of whole settlements in south-east Europe (as opposed to the destruction, possibly deliberate, of individual buildings: Tringham 2005), nor for preferring the explanation of defence over other roles for the majority of ditched enclosures (Turek 2012).

What we seem to see over and over again in the varying regional sequences of south-east and central Europe is an emphasis on commonality, in tension with the other, varied indicators of social difference. Commonality exists in settlements and cemeteries, and also in wider patterns of material culture, the latter a factor which tends either to be taken for granted within the culture history framework or ignored simply because it is ‘old-fashioned’ culture history. Generalizing deliberately, we do not see marked difference within settlements in terms of variation in size or elaboration of buildings. Most settlements are collectivities of buildings, and completely isolated houses are rare; in this sense, these are house societies, whether or not all the anthropological connotations of that term fully apply. People lived in communities, even if there were subtle (or in some cases, perhaps less subtle) differences within them. Even in LBK contexts, where there clearly is gradation in longhouse sizes, it is rare to find single outsized buildings, rather than pairs or more; such buildings might have had special roles as club or meeting houses, and the recurrent pattern is of fluctuating layouts through the varying phases of longer-lived LBK settlements.

Whilst we can be fairly sure that people lived or were based in the settlements identified in the archaeological record, we can be much less confident that the people found in cemeteries represent the whole of the population. For the LBK, this seems demonstrably not the case (van de Velde 1997), and the same should apply to many of the large cemeteries of south-east Europe (Borić, this volume). Those buried in formal burial grounds could therefore already be a self-selecting element of the community as a whole, but with that important caveat most cemeteries, like most settlements, seem to project commonality. There are often lines, rows, or other groupings within them, which could reflect the presence of individual lineages or other descent groups. In the LBK context, there are plenty of variations in the detail of grave orientation and body position, for example (Bickle and Whittle 2013b), but by and large through all these cemeteries in south-east and central Europe there are strongly shared, recurrent ways of dealing with the dead. There is potential tension again. On the one hand, the mortuary arena can be used for the relative elaboration of provision of grave goods, but this took place within the

shared space of designated burial grounds close to shared settlements. Living and dying well together seem to be key themes in the history of the European Neolithic, and appear to be key indicators of the sanction of the community. Leadership does not often emerge in a vacuum, without the tolerance of the majority.

Shared material culture is another important dimension of the commonality of Neolithic existence. Much dedicated research over the years has gone into the description, classification, and chronological ordering of this material, often prominently featuring pottery, and it is important that grander and wider interpretive perspectives do not overlook this basic feature. Familiar things must have helped to create and signal affiliation and belonging (cf. [Alberti et al. 2011](#)), even if we are uncertain if the changing distributions of pottery styles, for example, always mark bounded and fixed group identities; the scale of the LBK distribution suggests that this cannot always be the case. Not everyone necessarily had access to all desirable things; the LBK adze is strongly associated with males, notably men of local origin ([Bentley et al. 2012](#)), and *Spondylus* varies widely in its occurrence in LBK graves ([Bickle and Whittle 2013b](#)). I still think it is an open question whether we should regard gold and copper from modern perspectives, rather than as part of degrees of craft diversity and specialization, but even accepting the value conventionally placed upon these innovations, it remains striking how fragmented and piecemeal their initial uptake was. Graves at Varna with quantities of gold still stand out in the local, regional, and wider context, and if it is true that the copper came from a series of regionally available sources ([Chapman 2013](#), 324–325), it is a puzzle why such a supposedly desirable new material was not more widely and more rapidly copied elsewhere.

So now I believe that we need to accommodate both sides of the argument, rather than claim either steadily elaborating hierarchies or a persisting absence of differentiation. Tension between different values may have been an important dynamic in the history of the European Neolithic, which I will develop below. My brief has been to reflect on south-east and central Europe, but some cross-fertilization with debates elsewhere in Europe could also be fruitful. Reacting to models of pronounced social differentiation (including the possibility of state formation) in southern Iberia from the third millennium BC onwards, it has been suggested that despite demographic growth, possible agricultural intensification, the appearance of copper metallurgy, and the development of supra-regional exchange networks, no compelling evidence exists for institutions that overcame ‘self-regulation mechanisms that worked against inequality’ ([García Sanjuán 2013](#), 134). Another account of the southern Iberian Copper Age talks of ‘the rise of some kind of corporate groups (maybe

lineages), made possible and sustained through the cyclical involvement of different segments of society in collective labor processes', with a sense of community on the one hand but with lineage competition channelled into the mortuary sphere ([Díaz-del-Río 2011](#), 51). There is no sense in trying to solve the problems of one situation by importing models directly from another, but the language and tone to be used in these debates are crucial.

KINDS OF HISTORY: WHAT HAPPENED IN THE EUROPEAN NEOLITHIC?

The four themes which I have discussed are connected. Neither colonization nor acculturation on their own seem to account for the beginnings of the Neolithic in south-east and central Europe, though circumstances may have varied between regions, and there is much more to come from future genetic research. Given that, the varying styles of Neolithic existence probably involved from the start the integration of people of different backgrounds and histories. Much of the story is to do with shared life and death, though there could have been tensions between household and community, between descent groups and community, between locals and outsiders, or between any other range of dimensions, also from an early stage. Settlement regularly expanded in given regional situations, and numbers of people on the ground could increase markedly, but there was no clear, long-term trend to the intensification of agricultural production, even though fourth-millennium innovations like the wheel may have been locally significant; much activity in gardens and with herds and flocks may have remained within what [Marshall Sahlin \(1974\)](#) called 'the domestic mode of production'. There was tension between the shared values and sanctions of community, and the tendency of particular groupings within communities—be they households, clans, lineages, other descent groups, or other entities altogether such as sodalities—and between communities to seek enhancement of reputation and position variously through control of land, mobilization of labour, and the production and acquisition of fine, desirable things. There is now plenty of evidence for violent, often fatal, inter-personal and on occasion inter-group violence, but there must equally have been embedded means to solve disputes, for life in most places, most of the time, to go on.

What I see happening, at a big-picture scale, is the playing out of the tensions suggested above between commonality and more individual values. This took place over differing timescales and at different rates. The supposed crisis at or towards the end of parts of

the LBK cannot be documented everywhere within the LBK distribution, and probably does not apply at all in south-east Europe at the turn of the sixth millennium BC. After the end of the LBK, the ‘Danubian’ world of longhouse lives went on for centuries more; ‘rondel’ enclosures (Petrasch, this volume) could be seen as a means to regulate the renewed build-up of inter- and intra-community difficulties. There may well have been a cyclical pattern to this tension. It is for future research to date the timings of all these developments with much greater precision (see below), though it is interesting to note that both the ending of tell settlement in south-east Europe and the end of the longhouse tradition in central—and western—Europe (Link 2006; Last 2013) may have begun at more or less the same time in or after the middle of the fifth millennium BC. Perhaps neither system was able any longer to accommodate emerging differences. In a sense, it may have been corporate values which won out, as aggrandizers were unable to transform control of agricultural production or of material desirables into institutions of permanent and embedded inequality. The late fifth- and fourth-millennium big picture is widely one of settlement dispersal, with no clear evidence of universal agricultural intensification, but novel and very varied means of social display. In central and especially western Europe, that involves monuments, but that is another story for another time.

Another big-picture perspective has emerged over the past two decades, that of climate (e.g. Gronenborn 2010). In some models, climate seems to pull the strings, both enabling and constraining change in human society. It would be foolish to deny the potential effects of climate change on Neolithic communities, and where the evidence is of fine enough resolution, as in parts of the Alpine foreland (e.g. Magny and Haas 2004; Schibler et al. 1997), local effects on both settlement and production can be argued. For the most part, however, climate changes are very coarsely correlated with detailed Neolithic sequences, and the causation seems never to be the same: here a wet phase, there a dry phase. It is as though we were to try to explain the economic collapse of the Great Depression with the fluctuating weather reports of the era of late twentieth-century global warming.

It is not only the big picture which should be in the frame. We have abundant evidence now to investigate a plethora of particular situations, and the opportunity to combine ‘macro’ and ‘micro’ scales (Robb and Pauketat 2013). Helping to refine chronological precision has been my own recent focus (Bayliss and Whittle 2007; Whittle et al. 2011; <http://www.totl.eu>), within a Bayesian framework for the interpretation of radiocarbon dates (Bayliss et al. 2007; Bayliss 2009). The general chronological framework for the European Neolithic is

probably broadly correct, built up by patient excavation, study of associations, typology, seriation, radiocarbon dating, and some cross-checks with dendrochronology. Inappropriate radiocarbon samples, with age-offsets compared to their context, and visual inspection of results can both, however, lead to getting things wrong; a formal approach leads to much greater precision, and there are encouraging signs that this approach is beginning to be more widely adopted (e.g. [Raczky and Siklósi 2013](#); [Stadler et al. 2006](#)). Without this, things can wrongly appear to have begun earlier, lasted longer, and ended later than was the case in reality.

Why does this matter? The ‘big picture’ which I have sketched here is after all played out over two to three millennia or more, depending on where the focus is within south-east and central Europe. The long term has been our dominant perspective, in which things tend to happen rather slowly. But to espouse only the big picture is to assume that we know all the key answers in advance, and to blur the human scales of lifetimes and generations into much coarser narratives. If we are interested in the ending of tell settlement, for example, we need to exploit the much better sense of timing, duration, and tempo that formal chronological modelling can now provide. Big pictures can ultimately be reformulated with the help of much more precise, smaller-scale sequences. With tell endings, we have the means now (and the importance of archives and publication becomes ever greater) to replace a generalized account with a detailed record of what I believe (cf. [Link 2006](#); [Müller](#), this volume) will prove to be a staggered and regionally varied history, an unexpected turn of events set against conventional predictions of steady evolution.

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Note

1. Nearly all the dates given in this chapter should be read as cal BC, following international scientific convention; that for Arbon Bleiche is BC, being based on dendrochronology.

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CHAPTER 55

COMMENTARY

What Do We Mean by ‘Neolithic Societies’?

JULIAN THOMAS

INTRODUCTION

READING the rich and detailed contributions to this volume, one is struck by the complexity and diversity of the evidence that documents life in the European Neolithic. Faced with this degree of variability, one might question whether the communities that inhabited Europe and western Asia over a period of several millennia really had very much in common with each other. Some while ago, [Marek Zvelebil \(1989, 382\)](#) called for ‘a clear definition of what constitutes a Neolithic society’, but does this category actually have any general analytical validity across space and time? One conventional view is that the core and base of the Neolithic way of life lay in farming. According to this perspective, a relatively invariant subsistence economy had been slowly formulated in south-west Asia, and had then proceeded to expand westwards, whether by demic diffusion, purposive migration, or indigenous adoption. The argument holds that farming has a logical priority over the other innovations of the period, and that the various different elements of the Neolithic were built hierarchically on top of a new subsistence base. Thus agriculture promotes sedentism, increased population, domestic architecture, more elaborate material culture, craft specialization, social differentiation, and complex mortuary practice. It follows that whatever distinguishes a Neolithic society must always and everywhere be the consequence and outcome of a specific economic change.

But this argument is at variance with the extreme diversity of Neolithic societies across Eurasia that we have noted above. Not all of these practised cultivation and herding, used pottery or polished stone tools, lived in sedentary villages, venerated their dead, or took part in enhanced ritual activity, even if there was a marked tendency for the various elements of the ‘Neolithic package’ to co-occur. In south-west

Asia, [Trevor Watkins \(2010, 622\)](#) has demonstrated that the emergence of large, co-resident communities predated the domestication of plants and animals. Where previous interpretations have stressed the causal role of environmental changes in the adoption of agriculture, Watkins implies that economic diversification and intensification was driven by the growth of larger and more complex social groups, manifested in the development of more substantial architectural forms and elaborate treatment of the dead (see also [Malone](#), this volume). As late as the Pre-Pottery Neolithic A, some communities in south-west Asia who were beginning to construct monumental ceremonial structures were still making intensive use of wild resources rather than morphologically distinct domesticates ([Schmidt 2010](#)).

Equally, the middle Neolithic Pitted Ware culture of southern and eastern Sweden was distinguished by the presence of decorated pottery, polished flint axes, complex depositional practices, and ceremonial structures, and sometimes also by elaborate funerary observances ([Larsson 2006, 50](#)). Yet subsistence activities were dominated by the exploitation of marine species (seals and fish), with only limited evidence for domesticated cattle and pig (see [Schulting](#), this volume). So although these people were ‘culturally’ Neolithic, some might prefer to define them as Mesolithic on the basis of their limited reliance on farming. In the Netherlands, the change from hunting and gathering to agriculture was a rather protracted process, with wild and domesticated resources used together in various ‘broad spectrum’ combinations over a long period ([Raemaekers 1999, 25](#)). As late as the middle of the fourth millennium BC, freshwater fish and wildfowl remained important elements of subsistence ([Louwe Kooijmans 2011, 128](#); [Schulting](#), this volume). If economic practice alone were to be used as a criterion for identifying the Neolithic, the point at which Dutch societies ‘became Neolithic’ would clearly be quite difficult to define. Should it be the first appearance of domesticates, or the stage at which they constituted the majority of protein consumed, or the moment when wild foods disappeared? These developments need not necessarily coincide.

Similar problems of definition are evident in Britain. Here, cereals appear in the archaeological record shortly after the start of the Neolithic, around 3900 BC ([Brown 2007, 1048](#)). But following an initial period of enthusiasm, the representation of carbonized grain became scarcer after the thirty-seventh century BC, and (on the British mainland, if not the Scottish offshore islands) negligible after around 3300 BC ([Stevens and Fuller 2012, 714](#)). It is also possible that this decline was paralleled by a relaxation of the intensity of manuring, which was substantial at the primary Neolithic timber building at

Lismore Fields, Derbyshire, but less so at the causewayed enclosure of Hambledon Hill in Dorset, a few hundred years later (Bogaard et al. 2013, 12591) (although note that the authors of this work attribute the contrast to the possibility that ‘the cereals deposited at ceremonial aggregation sites [...] derived from less-intensive land-use regimes than cereals at settlement sites’). Both in Britain (Stevens and Fuller 2012) and in Ireland (Whitehouse et al. 2013) the apparent slump in cultivation has been attributed to a ‘boom and bust’ on the part of pioneer agriculture. Whilst it is perfectly possible that a decline in yields after an initial period of great fertility (Dark and Gent 2001) did contribute to a shift away from horticulture, it seems unlikely that this was sufficiently catastrophic to cause a generalized collapse of population and significant social disruption. For in both regions, the period between 3700 and 3200 BC actually saw an appreciable increase in the scale of monument building: first causewayed enclosures and then cursus monuments in Britain (Whittle et al. 2011), whilst Ireland experienced the *floruit* of passage tombs (Bergh and Hensy 2013). An alternative argument would suggest that the gradual abandonment of cereal cultivation corresponded to the growing importance of livestock, as manifested in the evidence for large herds of cattle at causewayed enclosures such as Hambledon Hill, and Windmill Hill in Wiltshire (Rowley-Conwy and Legge, this volume; Whittle et al. 1999). As the centre of gravity of diet and economic practice shifted toward animals, the growing of domesticated crops was perhaps treated more casually, and increasingly supplemented by the gathering of wild foods, a pattern that continued into the later Neolithic (*contra* Rowley-Conwy and Legge, this volume). Yet there is no sense in which we would wish to argue that Britain became ‘less Neolithic’ over this period, simply on the grounds that some aspects of economic practice had become less intensive. The implication of this is that communities either were or were not Neolithic: although economic regimes were variable, there was no intermediate social identity between Mesolithic and Neolithic.

VARIATION IN SUBSISTENCE PRACTICE

All of these examples point to the complicated reality that although the geographical spread of cultivated plants and herded animals was in many ways the most significant development of the European Neolithic, there was no standardized pattern of ‘mixed farming’ held in common by all Neolithic societies across the continent. Nor did agriculture form a temporally changeless infrastructure from which all of the other innovations of the period could be derived. As Brown,

Bailey, and Passmore (this volume) point out, the adoption of farming across Europe took the form of a patchwork of contingent developments, in which subsistence activity was repeatedly reconfigured in relation to local ecological and social conditions. But despite this, the pattern of economic change in the European Neolithic was not entirely random, and there were some directional trends that are worthy of note, as the process of Neolithization progressed from south-east to north-west. In their contribution to this volume, Bogaard and Halstead present a vivid and coherent account of the kind of Neolithic that became established in the southern Balkans in the seventh millennium bc. Here, long-lived settlements, many of which eventually developed into tell mounds, were composed of closely packed households engaged in intensive cultivation. Plant foods including cereals and pulses were the staples of the human diet, and only small numbers of animals (principally sheep and goats, but also cattle and pig) were kept. The meat of these animals was eaten infrequently, often in the form of shared meals involving a number of households, and there is little evidence for specialized dairying. Livestock were often grazed on the stubble in the small garden plots after harvest, or allowed to nibble the new shoots of sprouting plants to prevent them from growing too fast and lodging. Garden horticulture with small numbers of stock therefore represented an integrated and coherent economic system (Halstead 2011, 134). Halstead (1992, 32) presents the Greek and Bulgarian Neolithic as an instance of Marshall Sahlins' (1972) 'Domestic Mode of Production', in which all of the labour and equipment necessary for production are contained within the household. Under these conditions, there is a tension between the tendency toward social fission and economic underproduction, and the need for relationships beyond the household in order to acquire marriage partners and recruit extra labour at critical junctures in the agricultural year. This perhaps explains the role of feasting and complex material culture in maintaining relations beyond the house, and provides a context for the use of anthropomorphic figurines in the negotiation and definition of domestic roles and identities (Robb, this volume; Bailey 2005).

If the economic pattern of the first Neolithic communities in south-east Europe was based on horticulture, to which livestock were subsidiary (if tightly integrated into the strategy), animals subsequently appear to have become progressively more important. As Rowley-Conwy and Legge (this volume) note, the dominance of domestic species in faunal assemblages now increased, and cattle began to proliferate at the expense of sheep and goats. Indeed, large herds of bovids are now indicated in areas like north-west France (Tresset 2000). Although Rowley-Conwy and Legge attribute the

change in the representation of species to the forested conditions of central and western Europe, cattle appear to have emerged as a pre-eminent animal for a complex set of reasons. First, whilst pigs had been locally domesticated during the Mesolithic ([Krause-Kyora et al. 2013](#)), and the pigs introduced from Asia at the start of the Neolithic appear to have gradually interbred with, and eventually been replaced by European stock, cattle of Near-Eastern origin rarely interbred with European aurochs ([Tresset](#), this volume). In other words, the two species were treated in rather different ways, and the unadulterated bloodlines of cattle appear to have been something of a preoccupation. This reflects both their economic and social pre-eminence. At the same time, dairying seems to have gradually become much more important ([Copley et al. 2003](#)), whilst populations in northern and western Europe had probably by this time become lactose tolerant ([Beja-Perreira et al. 2003](#); [Shennan](#), this volume). This meant that animals, and particularly cattle, were now capable of providing a larger proportion of a community's protein intake, in the form of milk products. But over and above this, the change of emphasis from plants toward animals was also a change from a subsistence economy to a *wealth* economy. For as well as providing everyday sustenance, cattle represented a form of mobile capital, which could be converted into power and influence through feasting, could be given as gifts to secure alliances, or could be lent out to create clients ([Russell 2012](#), 322). Nonetheless, it is probable that Neolithic wealth was neither as alienable nor as personalized as that of the Bronze Age (see [Kristiansen](#), this volume). It is arguable that whilst the horticultural economy of the Balkan Neolithic presented few attractions for Mesolithic hunter-gatherers beyond a more stable and predictable source of rather unexciting food, a wealth economy based on animal capital offered greater inducements for indigenous people to either attach themselves to existing Neolithic groups, or for whole communities to 'become Neolithic'. A growing tension might thus have emerged between these temptations and the traditional focus of hunting societies on sharing, mutual aid, and social equality. Whilst the latter would have promoted temporary resistance to the adoption of Neolithic innovations, Mesolithic communities arguably played a greater part in the Neolithization of the Baltic and Atlantic zones than that of south-east Europe. In these northerly areas, stable, long-lived villages were rather scarcer than in southern and central Europe, and large funerary monuments seemingly supplemented their role as communal foci.

This evidence that Neolithic subsistence practices were both spatially and temporally diverse does not entirely chime with [Rowley-Conwy and Legge's suggestion](#) (this volume) that plant cultivation

took much the same form everywhere. Quite rightly, they emphasize the taphonomic factors that affect the representation of botanical remains on archaeological sites, but they underplay one important aspect of the formation of the archaeological record: contextual variation. It has long been recognized that the composition of both carbonized and waterlogged assemblages depends upon the location from which they were retrieved (Dennell 1978), and this may be a consequence of the stages of crop processing and storage represented at a particular site, the character of deposition, and the type of site being investigated. In the case of the large timber halls that characterize the earliest phase of the British Neolithic, Rowley-Conwy and Legge mention that the structure at Yarnton produced an assemblage dominated by hazelnut shells. But in addition, the large collections of cereal grain from the halls at Claish and Warren Field in Scotland were recovered from contexts associated with the decommissioning and destruction of the buildings (Thomas 2013, 307). These contexts also contained large numbers of pottery sherds, which had apparently been deliberately placed, whilst samples taken from elsewhere within the structures contained appreciably less grain. Clearly, these results have profound implications as far as the representativeness of these assemblages is concerned, and regarding what they tell us about Neolithic economic activities. Similarly, Andersen (this volume) notes that the large cereal assemblages from the Danish causewayed enclosure of Sarup had been deliberately deposited in two ceramic jars, again raising the question of how far they can be identified as a random sample of the products of everyday farming practice.

NEOLITHIC DISPERSALS

Several of the chapters in this book reflect on the diversity of processes by which Neolithic entities and practices spread across the European continent. Some authorities note that aspects of the Neolithic way of life may have been integrated by hunter-gatherer societies, having been transmitted in advance of Neolithic settlement. However, it has often been observed that the acquisition of a few cattle or pots does not necessarily render a community Neolithic (e.g. Tresset and Vigne 2007). It follows from this that the Neolithic cannot be defined purely on the basis of the representation of a checklist of traits, and must be understood instead in organizational or structural terms. Müller (this volume) makes the important observation that networks circulating obsidian in the Aegean actually predated the Neolithic. Similarly, the expansion of the *Bandkeramik* into central

Europe was prefigured by the exchange of mollusc shells and lithic raw materials over long distances into areas occupied by hunter-gatherers (Gronenborn 1998, 1998). This evidence implicitly challenges the received idea of Neolithic colonists intrepidly advancing into unknown territories. In fact, the colonization of unfamiliar landscapes is especially dangerous for agriculturalists, who would normally need to take many years to properly familiarize themselves with local soils and climate. Landscapes need to be 'learned' before they can be occupied, and knowledge is therefore one of the most important constraining factors on the expansion of agriculture (Meltzer 2003). It has been argued that the successful translocation of farming populations by 'leapfrog' colonization would have required the acquiescence and support of indigenous people, achieved through protracted contact and negotiation (Fiedel and Anthony 2003). It follows that the affairs of Mesolithic and Neolithic communities may often have been more entangled than we are accustomed to thinking (Borić 2005). Even where the expansion of the Neolithic involved the colonization of uninhabited islands, advance understanding would have needed to be acquired through scouting and visiting (Broodbank and Strasser 1991).

Whilst some areas including Crete and the Thessalian plain have produced evidence for planned, large-scale migration by agricultural communities, this was by no means a universal pattern (see Guilaine, this volume). Malone (this volume) notes that in several parts of the Mediterranean there are indications of a contrast between developments in the coastal zone and more inland areas. In the Adriatic, southern Italy, and southern France, maritime colonists associated with the use of Impressed Wares may have established sedentary sites on the coast (Broodbank 2006; Forenbaher and Miracle 2005; Guilaine and Manen 2007). Further away from the sea, often in upland areas, caves and rockshelters sometimes suggest continuity of occupation from Mesolithic to Neolithic (Mlekuz 2005). These sites may contain pottery, and the remains of either domestic or wild animals, or both. Two possible interpretations present themselves: either coastal Neolithic groups may have been practising transhumance and hunting away from their permanent settlements, or indigenous Mesolithic communities may have acquired pottery, sheep, and goats from them. If the latter, the adoption of these new elements will have had a transformative effect on the inland groups, gradually drawing them into Neolithic social networks. In contrast, in Atlantic Portugal it has been postulated that Neolithic colonists and Mesolithic groups using the shell middens of the Alentejo, Tagus, and Sado existed in close proximity to each other for some hundreds of years. Here there is no evidence for the piecemeal adoption of Neolithic

innovations, although some contact between farmers and hunters must have taken place ([Zilhão 2001](#)). In this case, long-term resistance to the changes associated with the Neolithic seems more probable.

There is, perhaps, a disjuncture between these sorts of complex micro-scale processes, increasingly invoked in archaeological accounts of the period and involving combinations of population movement of different kinds, acculturation, intermarriage, and economic transformation, and the larger-scale and more homogeneous developments sometimes implied from population genetics and ancient DNA studies ([Pluciennik 1996](#)). One recent investigation, for instance, suggests that the modern population of Europe is made up of the descendants of 'brown-eyed farmers' and 'blue-eyed hunter-gatherers', on the basis of a limited number of ancient DNA analyses ([Callaway 2014](#)). The uncritical equivalences that are sometimes set up between genetic groupings, categories of economic practice, and linguistic entities are potentially quite problematic. 'Farmers' and 'hunter-gatherers' were probably not fundamentally different kinds of people: they simply organized themselves and acted in rather different ways. Neither kind of community is likely to have been genetically homogeneous; their diversity would probably have only increased over time.

However, the large-scale analyses sometimes employed by archaeologists can have problems of their own. For instance, the summed probability analyses of radiocarbon dates discussed by [Shennan](#) (this volume; see also [Rick 1987](#); [Williams 2012](#)) indicate massive population increases at the start of the Neolithic in Belgium, the Netherlands and Germany. These developments are connected with the notion of a 'Neolithic demographic transition': the argument that new subsistence practices lead causally to sedentism and population rise ([Bocquet-Appel 2008](#)). The method uses the number of radiocarbon determinations within a given chronological interval as a proxy for the size of population. Where the behaviour of prehistoric people remained constant over time, it is reasonable to argue that an increasing number of dated samples reflect a growing number of people creating a greater number of dateable traces in the archaeological record. However, at the transition between the Mesolithic and the Neolithic, two other variables are introduced into the equation. Firstly, the nature of the archaeological record and its formation changes radically, in that many Mesolithic groups were mobile hunters who left a minimal trace on the landscape, whilst Neolithic societies dug pits, ditches, and postholes, some associated with dwellings or occupation sites and others with monumental structures, and placed their dead in graves and monuments, rather than dispersing their remains across the landscape ([Conneller 2006](#)).

All of these new contexts serve as ‘traps’ for organic materials suitable for radiocarbon dating, and much less likely to survive in the ephemeral occupation sites of the Mesolithic. The consequence of this is that as much as a change in population size at the start of the Neolithic, what is being measured is an increase in *archaeological visibility*. Secondly, one is also measuring the behaviour of archaeologists in the present, whose criteria for selecting dating samples vary between the accepted ‘periods’ into which the past is divided. It seems possible that these methods can in some cases result in misleading assessments of the date, scale, and location of population change (see, for example, [Collard et al. 2010](#)).

THE NEOLITHIC AS A FORM OF ORGANIZATION

If neither economic practice nor residential patterns were fixed over time and space, one alternative has been to argue that the core element of the Neolithic was a uniform cosmology or ideology (e.g. [Hodder 1990](#)). The Neolithic is thus a way of thinking. However, it is not clear why such a thing should escape transformation as material realities changed, and the notion that it might be based upon a conceptual division between culture and nature is arguably anachronistic, a product of modern western thought ([Collingwood 1945](#), 9). In the light of these difficulties, the present author has tended to argue in the past that the Neolithic is best understood as no more than a repertoire of entities and practices that were adopted in different ways by different societies under contingent circumstances (e.g. [Thomas 1999](#), 17). More recently, however, [John Robb \(2013, 658\)](#) has made the crucial observation that despite the particularity of the local processes involved, we also need to understand the Neolithic phenomenon at a global level. He notes that the shift from Mesolithic to Neolithic was a one-way process that spread across the European continent in a little more than two millennia. People for the most part did not revert to a Mesolithic way of life, and whilst as we have seen they sometimes did abandon or reduce their dependence on domesticated resources, this is not necessarily the same thing. Robb’s explanation for this is that the advent of the Neolithic involved a changing relationship between people and things, from which it was increasingly difficult for communities to extricate themselves. This argument carries resonances of [Hodder’s \(2012\)](#) account of the progressive process by which human beings have become increasingly ‘entangled’ with material objects, but has the additional virtue of identifying the Neolithic as a horizon of quantum change in person–thing relations.

There is much to recommend the view that any commonality that we can identify in the European Neolithic is likely to be found in the character of relationships and forms of organization, rather than the presence or absence of particular species or artefact types. However, there are two aspects of Robb's argument that need to be qualified. The first of these is that his article can be read as suggesting that social changes identified were essentially the *outcomes* of economic and technological developments. In other words, it potentially embodies a level of determinism. The second is that Robb appears to use the terms 'Neolithic' and 'farming' synonymously, thus perpetuating a difficulty that has bedevilled the debate for decades. 'Farming' and 'agriculture' refer to the practice of rendering living things as property, and *cultivating* them, in the sense of intervening in and channelling their proliferation and reproduction (Ingold 1996). The Neolithic, by contrast, was a form of sociality that facilitated both ownership and cultivation, and whilst it often co-occurred with farming in the Old World, it was not the same thing. The relationship between the two is comparable with that between capitalism and industrial production: they are conceptually distinct if historically intertwined.

Whilst Robb emphasizes the relationships between people and things, the transformation of the relationships amongst human beings formed an equally important aspect of the Neolithic transition. We have noted already that hunter-gatherers often have a way of life that is based on sharing, mutual support, and extensive, relatively fluid webs of social relationships. One of the reasons why foragers sometimes find it difficult to adopt agriculture is that their neighbours and affines will simply demand that they share out their seed corn or breeding stock for immediate consumption, with the result that they have no crops or herds left by the next season (Peterson 1993, 864; Woodburn 1982, 447). A set of arrangements that is highly effective in securing the survival of hunter-gatherers therefore militates against a change to more intensive economic practices. If such a change is to take place, a social transformation is required in order to bring increasingly bounded social units into being, which can serve as the holders of collective property. However, such a revision of what Karl Marx would call the social relations of production would only *enable* the adoption of a new form of subsistence, rather than determining the form that this would take: horticulture, pastoralism, mixed farming, or even the intensified and monopolistic use of wild resources (see Ingold 1980, 94).

Despite this emphasis on social relationships, the argument that I want to make here is distinct from Marxist orthodoxy in two important respects. The first is that it rejects the 'productionist

metaphysics' that represents the world as a massive store of inert raw materials that are at the disposal of humankind, whilst animals are simply biological automata (Heidegger 1977, 17). In this account, *production* involves the removal of matter out of nature, and its transformation by human labour, so that humans are the sole authors of whatever is *made*. An alternative to this vision is to see human beings as immersed in a world of active, vibrant and flowing materials and other animate creatures, whose configurations they alter through an engaged involvement (Bennett 2010, 4; Ingold 2012, 434). Secondly, I would like to blur the contrast that Marx relies upon between the forces and relations of production, to some extent. For it is arguable that what distinguishes the Neolithic is not only a fundamental change in the character of property relations, but also a much more imbricated relationship between humans and what Bruno Latour (2005) would call 'non-humans'. By this I mean not only that people owned and made more material things, and maintained more continuous connections with artefacts, plants, and animals, but that relations between humans were increasingly channelled through, sustained by, and delegated to non-human entities. Admittedly, the lives of both humans and animals are always supported and stabilized by places and objects that they can return to and reuse: cliffs, waterholes, fording places, forest clearings, and conveniently shaped stones (Ingold 2012, 429–430). But what distinguished Neolithic societies was the way that non-humans became more integral to their fabric: not just that people had more dealings with other kinds of beings, but that they embedded them in social relationships. Where hunters episodically and discontinuously engage with animals that are human-like, but are members of societies of their own, herders live continuously alongside animals that are contained within their own social unit. This would have had the paradoxical effect of making societies more durable, whilst introducing elements whose behaviour humans might not always have been able to predict or control. Thus the activity of a pastoral community is different from that of a hunting band, in that the former is a hybrid entity whose movements always involve a tension between the objectives of the humans and the desires of the livestock. Similarly, if social relationships are sustained by the circulation of artefacts and the inhabitation of architectural spaces, then breakage and decay, maintenance and repair can come to represent volatile and capricious aspects of the maintenance of social order.

This is not to say that the relationships that Mesolithic people had had with things and animals had been in any sense asocial. Whilst hunter-gatherers often understand animals to be human-like beings, who have to be treated with respect, they are nonetheless not

members of human communities, so that dealings with them tend to be discontinuous and transactional (Ingold 2000, 72). By contrast, the domestication of animals is a social process that renders them as a kind of kin, as well as sentient, animate property (Orton 2010, 189; Russell 2007, 28). Similarly, for hunter-gatherers the quantity of material things employed is often minimized by the combination of portability and sharing relations. Those things can certainly have an intense social and personal significance. For instance, it has been argued that Mesolithic tools composed of multiple microliths embodied the work of a number of different people, and this might have had the effect of restricting the claim that any one person would have on the meat of an animal slain with the arrow (Finlay 2003). But Mesolithic technology was as much concerned with mediating the relationship between people and the wider world as it was with articulating social relationships. Thus the distinctive stones that were collected for use as tools and amulets are likely to have expressed the relationships between persons and places, whilst long exchange chains that could generate alliances and indebtedness between people were much more characteristic of the Neolithic (Hardy and Wickham Jones 2003, 381).

We might say, then, that whilst Mesolithic societies were composed of extensive and relatively unbounded networks of relationships between persons, Neolithic societies were bounded but heterogeneous assemblages in which people, animals, and things were mixed up together. The density of made things in the Neolithic suggests a new way in which communities made themselves at home in the world, as well as extending their social presence beyond that of their corporeal bodies. But the most important aspect of this change involves the durability of social arrangements. In a world without state institutions, society is not a fixed entity so much as something that is constantly being brought into being. Where people or animals have few material resources beyond their own bodies, they find themselves continually having to define the parameters of their social world through a process of negotiation and testing (Strum and Latour 1987). For a hunting and gathering society, it is the resources of custom and tradition that are drawn on to supplement and strengthen the process of performatively creating and renewing social relationships, but this is none the less a costly and skilled operation.

Yet when animals and material things are incorporated into a society, a kind of 'splinting' occurs, where the temporalities of different kinds of entities become bundled together. This has the effect of extending the duration of social connections. Objects endure beyond single human lifetimes, and are passed between the generations, providing continuity (Joyce 2000, 190). The same is true

of herds of animals, which have a dynamic and a duration of their own, to which groups of people attach themselves. Moreover, both objects and animals contribute to a stabilized context into which new generations of people are born, and within which they become socialized (see [Mlekuz](#), this volume). Equally, both portable artefacts and architecture channel human movement and guide habitual practices, reducing the need for deliberation in everyday life, whilst the daily and seasonal movements of animals and the requirements of growing plants impose a more predictable rhythm on human existence. Overall, the change from Mesolithic to Neolithic would have been one in which a more elaborately crafted material world increasingly routinized social reproduction, reducing the risk of social rupture and the need for continual tactful negotiation.

In the British context, it is notable that much of the archaeological material of the earliest Neolithic embodies the themes of the initiation of identity, and the guiding of practice. The timber halls discussed above, for instance, were constructed during a short period immediately after the start of the Neolithic, and arguably represent a mechanism through which bounded communities were brought into being. This was ‘house building’ in both senses of the phrase: both the physical construction of a dwelling and the initiation of a co-resident social unit. The halls share with the timber mortuary structures or shrines beneath many earthen longbarrows an emphasis on inserting massive posts into the ground which stands as a powerful statement of the coming-into-being of a new kind of community ([Thomas 2013](#), 297). During the same period, pits containing the deliberately placed residues of episodes of habitation, and middens containing materials built up over many decades, both commemorated human activity in the landscape, and laid down the conditions for future action. To a much greater extent than in the Mesolithic, artefacts and architecture provided the ‘scaffolding’ for everyday life. This is one of the reasons why, as [Robin Skeates](#) points out in his discussion of underground ceremonial activities in the central Mediterranean (this volume, [ch. 47](#)), ritual and quotidian activities were often tightly intertwined during the Neolithic.

This point is particularly clear in the case of the deep shaft flint mines that were dug on the South Downs of Sussex from the very start of the Neolithic. These were not strictly necessary for the acquisition of good quality flint for the manufacture of polished axes, and indeed thousands of perfectly good flake axes had been made during the Mesolithic on flint from surface exposures ([Holgate 1995](#), 135). Yet the mines provided an architectural setting in which the various stages of productive labour were choreographed, so that the creation of value in material things was both contained and regulated ([Edmonds](#)

1995, 63). As [Capote and Díaz del Río](#) (this volume) argue, flint mines in Neolithic Europe were often remote from everyday activity, and their particular locations may have contributed to the value and meaning of the material that was extracted from them. Similarly, it is notable that the earliest structures preserved under long mounds such as Hazleton North and Eweford are often screens and façades ([Lelong and Macgregor 2007](#), 21; [Saville 1990](#), 20). These reveal a preoccupation with framing and staging social activity whilst creating spaces that were hidden or occluded, dividing access to performance and communication. In a different way, the Sweet Track across the wetlands of the Somerset Levels also represented an example of building practices that laid down the conditions for movement and action, so that subsequent acts become repetitive and routinized ([Coles and Orme 1976](#), 35). It is thus arguable that one of the main roles of architecture in the primary Neolithic was to regulate social interaction, rendering the outcomes of both ritual performance and everyday conduct more predictable and less risky.

THE PLACE OF THE DEAD

Another relationship that took on an enhanced importance during the European Neolithic was that between the living and the dead. The elaborate treatment of human corpses is one of the characteristic features of the European Neolithic, and took a variety of different forms, ranging from burials under the floors of domestic dwellings to the construction of massive funerary monuments (e.g. [Robb](#), this volume). At times, interactions with the dead could be intimate and physical: bones scraped of flesh, stacked, or placed together in new configurations ([Fowler and Scarre](#), this volume). In the context of the argument developed here, it is easy to recognize the role that ancestral remains might play in emphasizing both the coherence of a community and its continuity with the past. Communities that claim kinship with a common ancestor possess a greater potential for lasting solidarity and affinity. [Loveday](#) (this volume) makes the very significant point that the long-established model of Neolithic funerary monuments as enduring lineage ossuaries may not have applied throughout the period, or in all areas. As he points out, in some cases the human remains inside tombs and barrows may represent no more than a dedicatory deposit establishing an ancestral presence at a particular site. One of the unexpected findings of a series of Bayesian analyses of the radiocarbon chronologies of long cairns and earthen longbarrows in southern Britain was that the extensive assemblages of human remains contained within them had generally accumulated in a

relatively short period of time, often only a generation or two (Whittle et al. 2007, 131). The implication is that rather than the equivalent of a 'cemetery', in which the dead progressively accumulated over the centuries, mortuary monuments may often contain a group of founding ancestors, understood by the living generations as responsible for the establishment of their community. Like the timber halls already discussed, the building of such a structure could therefore represent a powerful statement of the coming into being of a distinct social group.

As Cummings, Midgeley, and Scarre (this volume) note, the earliest megalithic funerary monuments in western France were long mounds with closed chambers, apparently contemporary with the massive and sometimes decorated menhirs of the same region. Sequences in which closed deposits of small numbers of bodies appear early are known in other areas as well (Rocha 2005), again suggesting the theme of founding ancestors deposited in structures that announced the emergence of a new social order. Only later did passage graves develop in Brittany, Normandy, and Iberia, offering the possibility of protracted access to the mortuary deposit. As Cummings, Midgeley, and Scarre (this volume) point out, the open chamber accessed by means of a passage would have enabled skeletal elements to be retrieved for display and circulation, as well as making possible the successive introduction of new burials. Passage graves also revealed a growing preoccupation with placing the dead in relation to landscape features and the positions of the heavenly bodies and particular times of year (Hoskin, this volume). Later still, *allée couvertes* and *hypogées* often contained very large numbers of bodies, the earliest of which were sometimes pushed aside to allow new interments (Masset 1972, 300). The changing character of megalithic burial hints that the relationship between the living and the dead was one that shifted over time. This much is suggested by the growing importance of single grave burial (sometimes under round mounds, sometimes with grave goods) in the middle and later Neolithic in some areas. As Fowler and Scarre (this volume) argue for Beaker burials, this may have been connected with the emergence of new categories of dead. In particular, we can identify the growing importance of distinct lines of descent, rather than a generalized connection with the founding ancestors of an entire community. Increasingly, it became important that wealth and authority should be handed down to particular members of society. In the British case, mortuary practices emerged that emphasized the exit of specific persons from society, rather than celebrating a founding generation of ancestors. Toward the end of the fourth millennium BC, single grave burials began to be deposited beneath round barrows, often equipped with grave goods. From

around 3100 BC, these were superseded by cremation burials, which accumulated sequentially in 'cemeteries' that were often contained within circular monuments of one kind or another, probably the largest of which was at Stonehenge (Parker Pearson et al. 2009). At that site, an estimated total of no more than 240 cremated bodies was deposited over a period of a quarter of a millennium. This suggests a continuous process in which each successive interment was positioned spatially and temporally in relation to those that had come before.

THE TRANSFORMATION OF NEOLITHIC SOCIETIES

In many areas, funerary structures were the first major monuments to be built. Menhirs and alignments of standing stones might represent an exception to this pattern, although it is equally possible that stones might be set up in memory of particular ancestors, or even be understood as the physical embodiments of the dead (Tilley 2004, 57). By contrast, Andersen (this volume) notes a recurring pattern in which ditched or palisaded enclosures were constructed in relatively short 'waves', often some hundreds of years after the first Neolithic activity in a given region (see also Whittle 1988, 5). Andersen suggests that enclosure building may represent the hallmark of the emergence of a fully Neolithic way of life, bringing a protracted transitional phase to a close. In Britain, causewayed enclosures began to be constructed toward the end of the thirty-eighth century BC, and their spread from the south-east of the country echoed that of Neolithic entities and practices three hundred years earlier (Whittle et al. 2011, 683). It is tempting to see the development of enclosed sites as an indication that some kind of 'critical mass' had been achieved, perhaps in terms of a level of population that now required a higher level of organization (as implied by Renfrew 1973, 548). However, the development of the British enclosures also coincided with that of a series of regional exchange networks, circulating stone axes from quarries in the west, exotic forms of pottery, and other lithic materials (Smith 1971, 102).

We have argued that Neolithic societies were characteristically exclusive holders of collective wealth, and an inevitable consequence of this was that they were often intensely competitive and murderously violent (Schulting and Fibiger 2012). If mortuary monuments of one kind or another were connected with in-group relations, and the way in which solidarity in the present was constructed in relation to the collective past, it may be that part of the role of enclosures lay in regulating the relationship between communities and the wider world. Enclosures created the conditions under which different groups, and perhaps strangers from further

afield, could come together temporarily in order to engage in convivial relations, and to exchange goods, personnel, and information. Significantly, in both Britain and Scandinavia the emergence of a new generation of enclosures in the middle and late Neolithic coincided with the creation of new networks of inter-regional interaction. The palisaded enclosures of Zealand, Bornholm, and Scania were created in the period between 2800 and 2600 BC. At this time, new networks and assemblages were coming into being, with the Single Grave complex and the Battle Axe complex emerging alongside the long-established TRB (Larsson 2012, 119). Similarly, the more massively constructed palisaded enclosures of Scotland, Ireland, and England were connected with the southward extension of the Grooved Ware complex in the earlier third millennium BC (Noble and Brophy 2011; Thomas 2010; Brophy, this volume). At the risk of oversimplification, it may be that episodes of enclosure building were often connected with transformations of Neolithic societies in which inter-community competition was moderated by the development of inter-regional exchange networks and more encompassing identities. These latter may, in some cases, have involved new ceremonial or religious practices (see Loveday, this volume).

A further question that is raised by the use of the label of 'Neolithic society' is that of how far such a distinctive form of organization survived into the Bronze Age, and indeed whether it makes sense to talk of 'Bronze Age societies'. Bartelheim and Pierce (this volume) argue that to begin with, the small quantities of copper and gold deposited principally in graves might not have had much impact on societies in which power was still primarily based on agricultural production. In this sense, there is a degree of continuity between Neolithic and Bronze Age societies. But on the other hand, the restricted locations of metal ores and the new exchange networks that developed as a result, the scarcity of metalworking skills, and the potential of metal to be monopolized socially introduced new dynamics into European communities (Heyd and Walker, this volume; Kristiansen, this volume). Further, whilst agriculture retained its importance, its character changed in significant ways through the Bronze Age, whether through the emergence of permanent settlements and field systems, or forms of intensification such as irrigation or the Mediterranean polyculture (Barrett 1994, 147; Stevens and Fuller 2012; Gilman 1981). But it is arguable that the most important distinction between Neolithic and Bronze Age societies lay in the way that the latter were more fully immersed in durable large-scale social structures (Kristiansen and Larsson 2005, 108). Neolithic people were capable of prodigious feats of construction, the iconic example of which would be Stonehenge. These involved the mobilization of

colossal quantities of labour and resources, drawn from great distances (Viner at al. 2010). But the authority necessary to achieve these feats may always have been temporary and unstable, given the particulate and inwardly focused character of Neolithic communities.

CONCLUSION

In this chapter I have argued that although the spread of domesticated plants and animals across the continent was arguably the most significant development during the European Neolithic, it was underpinned by a distinctive social transformation. Whilst not all Neolithic communities relied completely on herding or cultivation, it is difficult to see how Mesolithic groups could have assimilated livestock or cereals without first undergoing fundamental organizational changes. These involved the severing of extensive webs of social connections in order to create circumscribed communities who shared access to a body of collective wealth, and the ‘socialization’ of a wider range of non-human entities, including animals, artefacts, and architecture. Henceforth, when long-distance contacts were established they took the form of exchanges (of persons, animals or artefacts) between separate and bounded communities. Human projects were now more likely to be channelled and sustained by these non-humans, and societies were made more durable in the process. However, the implication of this kind of organization was that Neolithic societies had a tendency to being highly competitive and independent. This militated against their incorporation into stable, large-scale authority structures. Over time, the forces that brought about the transformation of Neolithic societies appear to have been the development of inter-regional networks of exchange and interaction, a growing emphasis on genealogy and descent, and the intensification of subsistence economics.

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CHAPTER 56

THE DECLINE OF THE NEOLITHIC AND THE RISE OF BRONZE AGE SOCIETY

KRISTIAN KRISTIANSEN

THEORETICAL OUTLINE

IN this contribution I propose that there existed world historical epochs during the prehistory and early history of western Eurasia where communities, even when not directly connected to each other, shared basic conditions that enabled and constrained their evolutionary potential. The Neolithic and the Bronze Age represent such world historical epochs, and it is therefore pertinent to raise the question: what were the historical conditions or forces that led to the decline of the Neolithic and the rise of the Bronze Age? In raising this question I propose that there is a qualitative difference between Neolithic and Bronze Age social formations in prehistoric Europe, which fundamentally changed both their worldviews and their political economies. Consequently, once metallurgy was introduced and became integrated in the economy, the world would never be the same, and a Neolithic subsistence was no longer possible. This, however, is disputed by some ([Kienlin and Zimmermann 2012](#); [Kienlin 2012](#)), and I shall therefore explicitly make a comparison between seemingly similar tell societies in the Neolithic and the Bronze Age in the Carpathian basin to make my point clear. The transition also needs to be discussed, as the term Chalcolithic or Copper Age is often used to characterize much of the fourth millennium BC in this region. I shall argue that the adaptation of metallurgy and new ideas about property and inheritance inspired by the expanding urban societies in Mesopotamia and its hinterland enabled this transformation.

My theoretical point of departure is thus a combination of World System theory, here summarized in the concept ‘historical epochs’, and a political economy approach ([Earle and Kristiansen 2010](#)). I consequently employ a scalar approach that wedds an understanding of the political economy of local communities with the larger historical forces which indirectly governed their existence, even if this was

beyond their knowledge. In accordance with Marx, history is shaped under conditions inherited from the past and therefore not of our own choosing, and yet the accumulated force of multiple individual choices may change the direction of that history, when conditions are ripe. Therefore we need to understand those conditions that govern and motivate either stability or change: in short, the political economy.

According to [Kristiansen and Earle \(in press\)](#):

a political economy approach seeks to understand the linkage between the society's economy, power, and institutional structure as it unfolds both vertically (complexity) and horizontally (networks). In simple terms, this approach identifies the different horizontal and vertical social groups and their associations with contrasting interests. Fundamental is to understand the potential for different social segments to control in part the flows of resources that are used to support (finance) the political standing of different social segments. This ability to control economic flows in both subsistence and wealth depended on the creation of social institutions with specific cultural formations most importantly involving property rights and the formation of a new type of warrior aristocracy/institution to protect them. This approach is based on a Marxist analysis generalized to the new economic contexts of prehistory (see [Friedman and Rowlands 1977](#); [Kristiansen 1998, chapter 3](#); [Ekholm and Friedman 2008](#); [Earle 2013](#)). To this we add an analysis and interpretation of the social institutions that were new to the Bronze Age in order to secure long-distance trade and political stability, but also the potentially disruptive forces that may destroy such political networks.

In the following this theoretical and interpretative framework will be used to explore how Neolithic and Bronze Age economies and social systems differed. However, this demands further theoretical elaboration, not least regarding how different forms of social complexity operate.

COMPLEXITY IN NEOLITHIC AND BRONZE AGE POLITICAL ECONOMIES

The study of complexity is linked up with the old question of how power and inequality comes about. Under what circumstances will a majority of people hand over their power to a minority of people ([Earle 1997](#); [Flannery and Marcus 2012](#))? Both Neolithic and Bronze Age societies were complex; the question is how they differ in their complexity. It obviously depends on how one defines complexity. I define complexity as the structured and institutionalized distribution of power. Access to power thus becomes increasingly unequal when complexity increases (example: elites versus commoners). Complexity

is both vertical and horizontal, and the forms of integration involved in these arrangements define the limits and potential of power. Interacting systems are therefore the object of analysis, just as we need to employ a scalar approach that allows us to move from local to global and back.

We can distinguish between two forms of complexity: centralized and decentralized (Kristiansen 1984, 1998, fig. 18; Kristiansen and Larsson 2005, chapter 8.1). These are their main attributes:

- Centralized*: hierarchical structure around major centres; power and ownership concentrated; leadership and wealth concentrated—a staple finance system controlling resources essential to subsistence; vertical cosmology.
- Decentralized*: complexity without major centres; power and ownership distributed spatially; leadership and wealth movable—a wealth finance system driven by acquisition of prestige goods and gift exchanges; horizontal cosmology.

The two forms were always intertwined, but with one or the other dominant.

With this as a starting point I shall briefly explore how Neolithic and Bronze Age complexity was linked to different political economies in their integration of vertical and horizontal differentiation. I shall mainly refer to later Neolithic societies of the fifth and fourth millennium BC (cf. Heyd 2012). In the Neolithic we see the formation of some large settlements with high population figures in certain regions; however, these were not systematically connected, and in the long term they collapsed, rather than expanded. Here lies a major difference in complexity compared to the Bronze Age. Two factors were decisive: essential raw material could be obtained locally, with the exception of some prestige goods. There was no development of permanent higher-level institutions in charge of trade and alliance formation. There was consequently no development of interregional economic dependency and division of labour of the kind observed during the Bronze Age.

We may thus define most late Neolithic/Copper Age societies as regional political economies that were able to build up and control rather large populations in areas of high productivity. Good examples are the Tripolje mega-sites, or the tell settlements in east central Europe and the Balkans, or the mega-sites in Spain and Portugal, with fortified settlements interspersed by huge (several hundred hectare) settlements with enclosure ditches, such as Valencina de la Concepcion (Garcia and Morillo-Barroso 2013; Marquez-Romero and Jiménez-Jáimez 2013). Among tell settlements in east-central Europe we typically find a two-tier settlement structure, such as the Polgár-Csőszhalom site in Hungary in the Tizsa region. A central tell (2–3ha),

with a ritual circular structure and—in my interpretation—chiefly houses, is surrounded by a large 25ha settlement presumably of commoners (Raczky et al. 2011, figs 2 and 9). Some megalithic communities can now be demonstrated to have exploited and drawn in livestock from non-megalithic areas within economies operating at a regional scale (Sjögren and Price 2013). These may have involved a degree of centralization. Certain forms of prestige goods, such as jade axes, were distributed over large regions in Europe, with a typical fall-off curve from the centre (Klassen et al. 2011, abb. 7, 9, and 18), indicating prestige good exchange rather than trade and therefore not the ability to control other regional economies/chiefdoms. Therefore we should rather characterize these later Neolithic regional economies as territorial chiefdoms, spanning from simple to complex. This is based on an anthropological model in which chiefdoms are ranked societies where power is institutionalized and hereditary within chiefly lineages; competition and social mobility exists in such communities, although there is often a division between ‘chiefs’, ‘commoners’, and ‘unfree’ persons.

When we compare mobility in Neolithic and Bronze Age societies, we find that mobility was a dominant feature of both, but increased in the Bronze Age (Müller 2013b, tab. 3), especially during the early Bronze Age. Only the pioneer early Neolithic period can show a similar degree of mobility. It is likely that Bronze Age population figures were substantially higher than those in the Neolithic due to the fact that settlements were now continuously occupied, and encompassed much larger areas (Müller 2013b, figs 8 and 9; Rassmann 2011). This also allowed long-distance trade networks to develop and be sustained between many stable centres of inhabitation. This defines a major structural difference compared to the Neolithic, where trade and exchange networks remained regional. Contrary to this, Bronze Age metal trade was regular and organized/institutionalized, and it was interregional—universally so in Europe by c. 1600 BC. Few mining areas produced the bulk of metal to be systematically distributed via long-distance trade to all communities, yet huge quantities of copper were circulated on an annual basis. We may thus define Bronze Age political economies as interregional and decentralized, spanning from ranked to stratified societies in Fried’s terminology. They were part of a widespread metal economy where regional divisions of labour played a crucial role, and where chiefly institutions were sustained by tribute and warrior retinues. Before we probe more deeply into these structural differences, let us take a look at the decisive transformation from later Neolithic to Bronze Age social formations.

THE DECLINE OF NEOLITHIC ECONOMIES AND THE EXPANSION OF NEW DECENTRALIZED ECONOMIES: CORDED WARE AND BELL BEAKERS

More than 10 years ago [Janusz Kruk and Saunas Milisauskas \(1999\)](#) published an inspiring book on the rise and fall of Neolithic societies. Here they pointed to a global crisis in temperate Neolithic economies around 3000 BC, which in some regions led to a renewed expansion of non-Neolithic economies, such as Pitted Ware, and to the expansion of pastoral Yamna/Corded Ware groups that also introduced some metalworking ([Hansen 2011](#); [Heyd 2011, 2012](#)). Subsequently, this decline has been confirmed using thousands of C14 dates as a measure of population/settlement density, which in northern and western Europe shows a marked decline after 3000 BC, with a few exceptions ([Shennan et al. 2013](#)). One conclusion to be derived from these observations is that the expansion of a new social formation of Yamna/Corded Ware groups was helped by the crisis, which had then seriously diminished the power of Neolithic communities. In this respect Yamna and Corded Ware represented the expansion of a Bronze Age social formation into former Neolithic terrain, where most groups would live on a mixed stone/metal economy for another millennium, and where for some centuries old and new cultural identities and oppositions were maintained ([Czebreszuk and Szmyt 2011](#)). How did this Neolithic crisis or transformation come about?

In the western steppe in the fifth to fourth millennium stratified Chalcolithic societies were developing in the Balkan–Carpathian region, only to collapse or be transformed during the later part of the fourth millennium BC ([Chernykh 1992, chapter 2](#); [Sherratt 2003](#)). They adopted copper production on a limited scale, but with the potential to expand exchange networks and ultimately change the economy. However, they were not able to transform either economy or exchange network in the long run ([Müller 2013a](#); [Chapman 2013](#)). Instead a combined ecological/economic crisis set in around 3000 BC, but beginning even earlier around the Black Sea, when the mega-settlements of the Tripolje culture gradually collapsed.

Stretching from the Romanian Black Sea coast to the north-east of the Dniester–Dnieper Rivers, the proto-urban communities of the Tripolje culture created a barrier towards the west during this period. It represents what [Mallory \(1998\)](#) has called the first of three fault lines to be passed in order to explain the expansion of Indo-European languages. But more importantly they provide the demographic foundation for the later peopling of the steppe and the light soils of central and northern Europe. These proto-urban communities were

organized around fortified settlements with two-storey houses arranged in concentric circles, the largest settlements being from 100–400ha, and containing 5,000–15,000 people (Videjko 1995; Chapman 2012). Each community with satellite settlements would hold from 6,000–20,000 people, and a local group of several communities from 10,000 to 35,000 people. Their interaction with steppe communities and later abandonment or transformation into pastoral groups from the later fourth millennium onwards is still a matter of debate (Dergachev 2000; Chapman 2002; Manzura 2005), but it opened up an opportunity for a westward expansion into central and northern Europe of the new social and economic practices (Johannsen and Laursen 2010). It culminated in the formation of the Corded Ware culture shortly after 3000 BC (Czebreszuk and Müller 2001), whose rapid expansion is reflected in its ritual coherence over vast regions (Fuhrholt 2011, abb. 10). Some have called this a ‘barbarization’ or decline of the Neolithic (Kruk and Milisauskas 1999; Rassamakin 1999, 125ff, 154), but it represented a major transformation from centralized to decentralized economies.

The expansion of this mobile agro-pastoral economy was rapid and sometimes dramatic, as evidenced in a recently analysed multiple burial from Saxony-Anhalt, the result of a massacre on a small family group of 13 individuals (Meyer et al. 2009; Haak et al. 2008). During the early and middle Neolithic periods there were still large forest reserves preserved in Europe, although mainly on lighter soils. However, during the early third millennium BC these areas were colonized by expanding pastoral herders and warriors with an apparently never-ending appetite for new pastures, who rapidly burned down the forests to create grazing lands for their animals, as evidenced in pollen diagrams (Andersen 1995, 1998; Odgaard 1994; Kremenetski 2003). The expansion could have been helped also by climatic changes (Paschkevych 2012). As land-use was extensive it demanded much larger tracts of open land to feed people and animals than in a more sedentary (centralized) agrarian economy, and to facilitate communication and travels they employed ox-drawn, four-wheeled wagons (Burmeister 2004). The mobile lifestyle is also exemplified by the use of mats, tents, and wagons, which are sometimes found in burials (Ecsedy 1994; Shislina 2008, figs 27 and 28). Strontium isotope evidence of migration of individuals is beginning to emerge and sustain archaeological interpretations (Gerling et al. 2012; Irrgeher et al. 2012; de Jong et al. 2010). In western Jutland the decimation of the forest during less than one hundred years and the creation of open grassland and heath is due to a massive immigration of a new population, the Single Grave culture, with a new economy and social organization that demanded open land

for their grazing herds (Kristiansen 1989).

The newcomers practiced some cultivation of cereals, especially barley (Robinson and Kempfner 1987), but the economy was based primarily on animal products, as reflected in diet (Kolar et al. 2012), and they expanded through a combination of warfare and recruitment of new members through clientships (forged through gifts and ethnic incorporation) and other means of social dominance. For instance, language was replaced in some areas due to mass migrations (Anthony 2007; Kristinsson 2012), as in western Jutland. Small houses or huts appeared during the later stage of the Corded Ware and Single Grave culture (Liversage 1987; Müller et al. 2009).

Complex Chalcolithic societies also emerged in the Iberian Peninsula with a concentration of population living in huge settlements, some fortified. They stretched from Zambujal at the Tagus estuary in Portugal to south-east Spain and Los Millares, to name but the best-known. Huge, densely populated settlements and causewayed enclosures were also located in the region, as throughout much of contemporary Europe (Garcia and Morillo-Barroso 2013; Marquez-Romero and Jiménez-Jáimez 2013). These complex centralized societies in Iberia collapsed and transformed into smaller expanding, maritime Bell Beaker groups in the second quarter of the third millennium BC, and they brought with them not only new metallurgical skills, but also skills in boat-building and mining (Case 2004; Laubaune 2013; O'Brien 2004). Their expansion was both toward the western Mediterranean, to north Africa and Sicily (Guillaine et al. 2009), and northward to France and north-western Europe (Prieto-Martinez and Salanova 2009; Prieto-Martinez 2012). From here communities using Bell Beakers moved into central Europe (Heyd 2007), and mixed with Corded Ware groups, creating a Proto-Celtic language in the process. But more importantly they created a new metallurgical economy that was gradually adopted throughout Europe, along with more intensive agriculture (Lechterbeck et al. 2014). They also crossed the channel to the British Isles (Needham 2002, 2005, fig. 3), represented by the famous Amesbury archer and his companions (Fitzpatrick 2011), and in Ireland by the Ross Island mining community (O'Brien 2004). This 'out of Iberia' scenario for the origins of Bell Beaker expansion has recently been supported by extensive studies of tooth morphology in 2,000 Bell Beaker burials in several regions of continental Europe (Desideri 2011), among other evidence (Czebreszuk 2004; Nicolis 2001; Fokkens and Nicolis 2012; Prieto Martinez and Salanova 2013).

Bell Beaker groups expanded along the western Mediterranean and along the Atlantic façade before they moved inland (but never further east than Hungary), and they always settled in small pockets. They

were travelling artisans that were well received because of their skills ([Price et al. 2004](#); [Vander Linden 2007](#); [Heyd 2007](#)), but they were also a demographic force looking for new places to settle ([Vander Linden 2012](#)). Through hybridization between the Corded Ware/Single Grave culture and the expanding Bell Beaker culture there emerged a hybrid Beaker culture ([Needham 2005](#), fig. 3). This new culture experienced a rapid expansion that transformed society in much the same way as the Corded Ware and Single Grave culture had transformed temperate Europe 300 years earlier.

THE NEW INSTITUTIONS OF THE BRONZE AGE: THE ORIGIN OF THE FAMILY, PERSONAL PROPERTY AND GENDER DIVISIONS

As I have demonstrated, there is mounting archaeological and scientific evidence that centralized late Neolithic/Copper Age societies were replaced by expansionist, decentralized societies by the third millennium BC. The background to this historical change was in part linked to the rise of proto-state societies and urban life in Mesopotamia and the Near East that marked the beginning of the Bronze Age. Consequently there developed new needs for these proto-states to establish relations with the outer world to get access to a number of essential goods located outside their own territories, such as copper, tin, and—later on—also horses. The so-called Uruk expansion of the mid to later fourth millennium BC ([Algaze 1989](#); [Stein 1999](#); [Aubert 2013](#), chapter 6) created these new links that circulated copper from the Caucasus in exchange for new types of prestige goods and technological knowledge ([Courcier 2010](#); [Dolukanov 1994](#), 326ff.; [Sherratt 1997](#)). From this interaction there emerged new ranked chiefdoms in the Caucasus by the mid-to later fourth millennium BC, called the Maikop culture, who buried their chiefly lineages in large kurgans or barrows with rich grave goods ([Rezepkin 2000, 2010](#)). But other social institutions were adopted as well.

The early city-states of Mesopotamia had developed new means for trade and exchange that demanded new concepts of property and its transmission. This in turn entailed a new economic and legal definition of family and inheritance ([Diakonoff 1982](#); [Postgate 2003](#); [Yoffee 1995](#)). These new concepts were selectively adapted to a different and less complex social and economic environment in Anatolia and the Caucasus, as well as the Aegean ([Rahmsdorf 2010](#)). The royal kurgans and Mesopotamian/Iranian imports of the Maikop culture in the Caucasus ([Sherratt 1997](#), chapter 18; [Ivanova 2012](#))

represented new institutions based upon a new concept of rank linked to movable, personal property, mainly in the form of prestige goods including metal and herds of animals. This new social organization was ritually manifested in a new type of *kurgan* with individual burials and rich personal grave goods to symbolize the new standing of personalized property and power. It was quickly transmitted to steppe societies where it caught on and was wedded to a new expansive pastoral economy of mobile wealth of herds of animals (Kohl 2001, 2007; Rothman 2003; Kristiansen 2007).

I thus propose that transmission of a new family structure from the city-states of the south (the Uruk expansion) with new definitions of family, property and inheritance helped to facilitate the social formation of a new mobile agro-pastoral society in the steppe region and beyond, also including an Iranian hinterland (Ivanova 2012). It constituted the monogamous family group as a central social and economic institution based on a patrilineal kinship system. It favoured the accumulation of mobile wealth through expansion and the formation of external alliance systems (Kristiansen and Larsson 2005, chapter 5), and mobile wealth that could be carried along and even transmitted between generations. The new funerary ritual of individual burials furnished with these very same symbols of wealth and covered by barrows represented the ritualized institutionalization of these new principles as they were now also transferred to the land of death, when property had to be transmitted and redistributed.

Another important institution that was introduced from the early city-states to their closer peripheries in Anatolia and the Caucasus was that of organized warfare under royal or chiefly command. In the Eurasian societies of the third millennium BC the male herder-warrior became a new ideal. This can be attributed to the institution of chiefly leadership with low levels of institutionalized or heredity inequality (Vandkilde 2011; Reinhold 2012). It was materialized in the widespread role of the carefully executed war axe in precious stone, copper, silver, or gold, later supplemented with the composite bow. But the contours of a more complex division of social roles and institution were also emerging. Specialists, such as the metal smith, began to appear in burials, and ritualized priestly functions were also demonstrated in grave goods, from the steppe to central Europe. A more complex society of warriors, priests, craft specialists, and herders/farmers was emerging, although yet in embryonic form (Hansen 2002, 2011; Müller 2002; Shislina 2008; Schwarz 2008). The expansion of this kind of society was facilitated by the demographic surplus that emerged when the large Tripolje settlements of tens of thousands of people were dissolved during the mid to late fourth millennium BC and had to find a new way of living in dispersed family

groups.

From the new institutionalized roles of leadership linked to warriors, priests, and craftsmen, and the new rules of family and kinship to control property and mobile wealth, there also followed new and stricter definitions of gender roles (Harrison and Heyd 2007, figs 45–48; see Fig. 56.1).

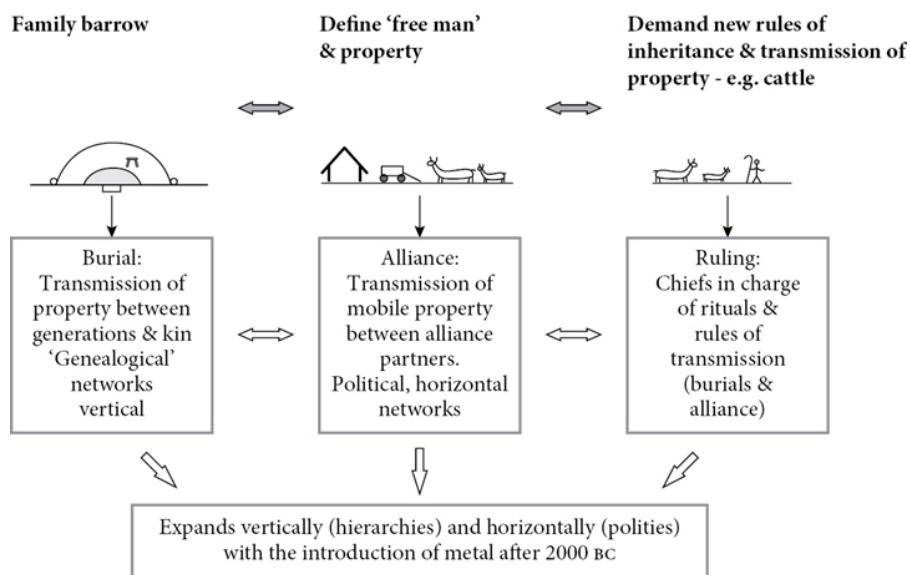


FIG. 56.1. Model of basic material and institutional components of western Eurasian societies of the third millennium BC.

Figure 56.1 presents a model of this social organization and its basic components. The most important of these was the family barrow or tumulus, which became the ritualized extension of a new kinship system where the transmission of mobile property (herds) played a crucial role through inheritance and partnerships. The barrow thus defined ritually the free man, his family, and his property, and it also defined the male warrior as heading a new institution of chieftainship. Male and female genders were strictly and rigorously demarcated in burial ritual through the orientation of the body, laying on the left or right side. This ritual institution remained stable throughout western Eurasia during several hundred years, and it speaks of a social and ritual commonality of vast geographical proportions, but also of a highly regulated society.

There can be no doubt as to the important role of gender, although male burials always outnumber female burials. Mobile herding societies often exhibit a strongly gendered division of labour, and this we see reproduced in burial rituals throughout the third and second millennia BC in Eurasia. In an agro-pastoral society of herding based

upon property of animals and their produce, rules of transmission and of inheritance become important. Therefore there had to be specialists—whether chiefs or other persons—in charge of maintaining and performing a corpus of ritualized rules.

To summarize, during the third millennium BC there emerged a new social and economic order in western Eurasia, supported by major population movements. The change was therefore not only social but also demographic and genetic, as recent evidence, although still sparse, suggests that the haplogroups that were introduced by Tripolje/Yamna/Corded Ware and Bell Beaker groups were transmitted to modern Europeans (Nikitin et al. 2010; Brandt et al. 2013). By the mid to late third millennium BC common ritual and social institutions were employed from the Urals to northern Europe within the temperate lowland zone as part of what Philip Kohl (2003, 21) refers to as ‘an interconnected world’.

WHAT IS THE DIFFERENCE: NEOLITHIC AND BRONZE AGE TELL SOCIETIES COMPARED

Background to the problem

What are the major qualitative differences—if any—between more complex Neolithic societies, such as tell settlements, and mature Bronze Age tell societies? Whilst a general consensus exists among researchers that Bronze Age societies were differentiated in terms of hierarchy and complexity distinctly from Neolithic societies, recently some have questioned if these differences are simply of degree rather than of kind (Kienlin 2012). Yet despite considerable quantitative continuity between the Neolithic and Bronze Age of Europe, developing prestige goods exchanges and commodity trade, especially in metal, caused significant institutional (qualitative) restructuring. Using a comparative analysis, we can recognize that substantial variation existed both through time and across space in the Neolithic and Bronze Ages. Although sometimes creating an impression of similar organizational complexity, the reality was two sets of societies articulated to very different political economies and social formations, not least when taking into account the spatial dimensions of social organization.

Scales of interaction

Neolithic tell societies may provide many points of similarity to

Bronze Age tell societies, when they are considered in isolation as a listing of traits. Local populations during the Neolithic could be substantial; however, they were not embedded in regular networks of international metal supplies. It is only by the Bronze Age that population figures rose significantly over Neolithic ones and that settlements and open land became continuous. This difference has been well demonstrated in several recent studies (Müller 2013b; Rassman 2011, abb. 4 and 5). As described by Andrew Sherratt (1997), Neolithic communities were linked by regional exchange in basic commodities such as flint, and periodically interregional connections were established through migrations that might lead to technological transfer. Long-distance connections, however, were often short-lived (Müller 2013a; Chapman 2013). They were typically based on select prestige goods and these could encompass larger regions, following a traditional fall off-curve of exchange (Klassen et al. 2011, Abb. 7, 9, and 18). Thus Neolithic political economies were based almost exclusively upon the exploitation and control of local resources. When more exotic goods were traded over larger regions they show a characteristic fall-off pattern in abundance that contrasts with the Bronze Age trade. Nowhere during the Neolithic and Copper Age do we find permanently organized, long-distance ('international') trade networks of the kind that provided all Bronze Age communities with metal and other wealth from a few source areas on a regular basis. This contrast has been most explicitly demonstrated by recent network analysis from Bulgaria (Merkyte and Albek 2012, figs 2 and 3). All Bronze Age communities were dependent on metal for their social identity, warrior weaponry, and basic subsistence economy from the middle Bronze Age onwards. Across Europe and into Asia, copper and tin had to be provided on a regular basis from mines hundreds or even thousand of kilometres away. This international flow must then have been connected with reciprocal flows of exports that apparently included salt, cattle, wool/textiles, amber, and jet, and the list probably goes on to include skins of wild animals, slaves, horses, and other commodities. We therefore propose that the emergent political economy shifted towards a world system of trade, transforming the very institutional nature of society.

Taking a political economy approach to the prehistory of the Carpathian Basin, we start with two reasonable expectations. First, according to the specific location in the Basin, local social groups were articulated differently with the dominant political economy. We therefore expect a fundamental social and economic variability to be manifested during both periods. Second, as international trade in metal and other wealth items picked up, the institutional character of society should be transformed fundamentally, although the specific

structure of society will differ from place to place.

The pattern of Bronze Age tells in the Hungarian basin documents this fundamental change from the Neolithic to the Bronze Age (Remenyi 2012; Szeverényi and Kulcar 2012; Uhner 2012). Rather than being concentrated in the lowland agricultural lands along the Tisza, as documented for the Neolithic, the primary distribution of tells sees them line up as beads along the Danube. A recent intensive survey of settlement along the Benta Valley just south of Budapest located very few Neolithic or Copper Age settlements, and no tells; by contrast, in the Bronze Age, a major tell settlement and a secondary tell right above the Danube developed rapidly (Earle and Kolb 2010). Along the Danube, settlements were thus formed in vacant or virtually vacant areas. Why? These locations along the Danube make little sense for agriculture because the river would have truncated access to half the circular catchment area available to a village located centrally within its agricultural land. In fact, the tells and their associated settlements were placed where they could have dominated the movement of wealth along the main river route for international trade in the Bronze Age of central Europe. Likewise, tells are grouped along the foothills of the Carpathians where they controlled the large-scale extraction and possibly trade in salt, and perhaps also horse breeding (Dietrich 2012). Admittedly, tells are found in both the Neolithic and Bronze Age periods and in both periods they almost surely linked groups to specific places that defined property rights. The contrasting locations between the two periods, however, show a distinctive shift in what is owned (or controlled) with a dramatic shift in the nature of the political economy and the structure of society. Ownership of agricultural land for staple finance would have been pre-eminent for the Neolithic in contrast to ownership of passage routes significant for the international trade in metal in the Bronze Age.

The shift from land-based exchange in the Neolithic to high-end international trade with boats along the rivers created clear bottlenecks that local populations controlled to extract metal as it moved through their territories overlooking the river (Earle 2013). The tell locations on the Danube allowed for a regular revenue source in foreign wealth, which would have transformed political structure and identity categories. In the Bronze Age cemeteries, only 5% of the burials included bronze, and it appears to indicate a special class of individuals. In the metal hoards that appear at the same time, the concentrated wealth that they represented took on a critical defining characteristic for society's institutions. By adding weapons and horses to the cultural inventory, a warrior elite apparently arose as a dominant social segment. It is important to realize that we do not view such warriors as all-powerful; the power of a chief is always

contested locally by a heterarchical mix, as seen, for example, by several sizeable, contemporaneous agrarian settlements in the Benta Valley (Earle and Kolb 2010). Whilst recognizing that power would always have been contingent, the position of tells and the addition of status-defining metal wealth and weapons demonstrate a fundamental institutional (qualitative) transformation in Bronze Age society from its predecessors in Hungary and beyond.

Further to the implications of regular long-distance trade in metal and other commodities

The Bronze Age became a more mobile world for the simple economic reason that copper and tin, or bronze in finished or semi-finished form, had to be distributed throughout the known world from a few source areas. Systematic commodity trade in copper and tin (Bartelheim and Stäuble 2009; Shennan 1993; Bell 2012) and in woollen textiles and salt (Harding 2011; Harding and Kavruk 2010; Kern et al. 2009; Kowarik et al. 2010; Lassen 2010; Monroe 2009) formed the life blood of an international Bronze Age political economy that overlay and integrated the continuing staple economies of Europe and beyond. The control of copper and salt mines and the subsequent trade in these commodities had the same economic significance as the control of and trade in oil and gas resources has today.

During the Bronze Age such trade was probably couched in political alliances where prestige goods played an important role in forging such relationships—whether in Barbarian Europe or in the Near East, as exemplified in the ‘Amarna diplomacy’ of fourteenth-century BC Egypt (cf. Cohen and Westbrook 2000). One precondition for the operation of this economic and political system that was based on a dialectic between staple and wealth finance (Earle 2002) was the rapid development of new maritime technologies during the late third and early second millennium BC, which for the first time allowed safe sea journeys over longer distances and provided larger ships that carried bulk cargoes across open waters (Kristiansen 2004; Needham 2009). These boats, however, could never have travelled safely without carrying warriors for their protection, much as is illustrated by the analogous trade by the medieval Vikings. Likewise the chariot throughout Eurasia came to symbolize a new speedy transport for warfare that had long-term historical consequences in the breeding of horses for transport (Kelekna 2009).

These technological revolutions expanded the potential for long-distance mobility and interaction on a systematic basis from the beginning of the Bronze Age, and by combining sea- and land-based journeys new regions could suddenly be connected. The volume of

trade expanded both the scope of commodity transport and the demands for specialists—in shipbuilding and navigating at sea, and the construction of wagons and training of horses for land transport. New specialized social groups emerged along with a new institutional framework to support them, and such specialists expanded the cognitive geographies of Bronze Age communities tenfold or more. The archaeological reconstruction of such a trade network linked by strategic marriages ([Kristiansen and Larsson 2005](#), fig. 107) demonstrates that specific groups with specific swords, such as octagonally hilted swords and flange hilted swords, were able to move and travel long distances. This movement can now also be supported by strontium isotope analysis, such as at Neckarsulm: a cemetery of males, mainly warriors, where one third were non-local, and thus probably had travelled to take service with a foreign chief ([Wahl and Price 2013](#)).

The regular connectivity between Bronze Age communities meant that knowledge about faraway places could be obtained and controlled. Craftsmen could have been enticed by local leaders to move across great distances, and traders became new specialists that provided knowledge and organizational skills to connect distant places and their goods. Warriors became widely sought after as mercenaries in the east Mediterranean during the late Bronze Age from the fifteenth century BC onwards, as is well attested in texts and on stelae, not least in Egypt ([Morkot 2007](#)). Such proposed movement of warriors explains how new sword types would spread rapidly from the Mediterranean to Scandinavia probably within a few years ([Sherratt 2003, 2009](#); [Hughes-Brock 2005](#)). Thus the combination of trade in metal and possibly in arms, as well as travelling traders and warrior groups and their attached specialists, created an interconnected ‘globalized’ world without historical precedent.

Comparative analysis concluded: what was new to the Bronze Age

Regional economic division of labour

Because the products every community needed or craved were located in different regions—tin in Cornwall and Galicia, copper in a variety of places, amber in the Baltic, salt in the Alps and the Carpathians—from at least the middle Bronze Age onwards, an interregional/international trade system emerged to distribute these products in large enough quantities throughout the known world to satisfy local demands far away from source areas. Because some products such as amber and tin located in northern Europe were needed in the

Mediterranean, these regions would soon profit from a competitive advantage, and became rich in metal and other imported products. For the first time we see the formation of an economic division of labour between regions, which had heavy implications in the political economy and led to the formation of new social institutions and more complex and ranked societies. However, complexity and power took on new forms different from those in the palace societies and city-states in the Mediterranean that were able to control and tax a larger territory and could use writing to keep track of transactions (de-personalized control).

Decentralized complexity

Power resided in social networks that extended beyond the immediate local resource area, and was underwritten by personal bonds rather than written treaties and contracts. Participation in the metal trade and in other new forms of long-distance trade in wool/textiles and salt would have demanded the creation of political alliances linking polities together—sometimes in confederations—in order to protect traders and their products. Participation in such institutionalized networks (providing wealth finance) and the formation of institutionalized warrior groups enabled local chiefs and centrally located tells to mobilize local resources (staple finance) by controlling the distribution of metal for both subsistence and prestige goods.

New weapons and warrior institutions

To protect trade, warriors were needed, and the Bronze Age witnessed the formation of a whole new set of weapons (swords, lances, protective body armour) that for the first time led to the formation of more permanent warrior groups and retinues, which among other things is evidenced by systematic use wear on swords and lances, and trauma on skeletons ([Kristiansen 1984, 2002](#); [Harding 2007](#); [Harrison 2004](#); [Horn 2013](#); [Uckelmann and Mödler 2011](#); [Vandkilde 2011](#)). These new weapons were much more deadly and efficient than anything preceding them, and the warriors also demanded regular training to master effective swordsmanship. In short, the swords introduced a new institution of warrior elites with retinues that could be mobilized and hired as mercenaries when needed. This new panoply of weapons was to be in continued use until historical times ([Kristiansen 2013](#)), and it became an institution that could be mobilized by chiefly leaders, but which could also overthrow them.

New means of transport and new open landscapes

Participating in such expansive in trade put further demands on infrastructure. Some settlements were localized along important waterways, as in Hungary, or along important overland routes, as in Denmark (Holst and Rasmussen 2013). We also witness the formation of continuously open landscapes that allowed travel and transport to take place along structured tracks connecting settlements for hundreds of kilometres. In addition, we see the formation of a new maritime economy along the coastlines of Scandinavia with its own ritual language of rock art and cairns facing the sea (Kristiansen 2004; Ling 2008, 2012). Similar maritime economies arose along the Atlantic façade, and soon allowed maritime long-distance trade a new economic role (Needham 2009; Rowlands and Ling 2013).

External and internal sources of power from the Neolithic to the Bronze Age

During the Neolithic we see complex societies emerge, and in some areas large populations in tell-like settlements. Their internal organization was complex and based upon an organized and regulated use of the landscape and its resources in a staple finance system supporting territorial chiefdoms. Some of these were obviously complex but could not be sustained in a temperate environment. Regional economic and cultural borders also confined the distribution of goods. There were initial attempts during the Copper Age to develop a metal-based, international economy, which failed. It would seem that the Neolithic economy remained Neolithic precisely because it could not break out of its localized regional economies, grounded in staple finance, and therefore in the long run became vulnerable to overpopulation and degradation of the local resource base, leading to collapse and migrations. During the Bronze Age an interregional metal economy developed that stimulated other forms of interregional trade and travel, thus allowing for more leeway in growth and decline as people moved between local and regional polities. Power now resided primarily in the trade economy of decentralized political networks, as wealth finance. Bronze Age societies were thus more vulnerable to external changes in production and demand of metal, and to internal competition and warfare over the control of trade routes. This shift in the overall balance of the political economy and the origin of power from staple finance to wealth finance (with many degrees of variation) makes it justified to characterize the Neolithic and the Bronze Age in their mature form as world historical epochs with a fundamentally different outlook and world view.

CONCLUSION

In this contribution I highlighted what I consider to be some major qualitative or structural differences between Neolithic and Bronze Age societies. The historical transformation between the two world historical epochs took place during the transition between the fourth and the third millennia BC ([Hansen and Müller 2011](#); [Hansen et al. 2010](#); [Smith and Rubinson 2003](#)), as it paved the way for a new type of social organization based on new notions of family, and of property and its transmission, coupled to the introduction of new metallurgical knowledge. However, it took another millennium before this new social formation unfolded its potential in Europe, which happened only when bronze became an economic foundation and thus restructured the political economy around a new set of institutions, leading to more complex societies at a global level. It may be suggested that the later Neolithic/Chalcolithic mega-sites in both eastern Europe and the Iberian peninsula represented an attempt to carry on a Near Eastern evolutionary trajectory towards urbanization and state formation which failed. And part of an explanation for this failure is perhaps to be found in comparisons with the Bronze Age, when institutionalized trade networks needed to sustain larger populations in the long term developed along with a regional division of labour and resources.

A discussion about differences between the Neolithic and the Bronze Age is therefore useful, because it highlights some fundamental theoretical and interpretive issues about the nature of later European prehistory. I have criticized those who prefer to view Neolithic and Bronze Age societies as basically similar for disregarding the economic role of interaction and commodity trade during the Bronze Age, despite apparent similarities in social organization. Likewise the role of bronze weapons and of warrior retinues defined a new social institution with capacities to control and conquer on a scale unknown in the Neolithic. Thus, whilst Neolithic societies could form impressive territorial chiefdoms, they were not grounded in a global system of social institutions that enabled the systematic extraction of tribute and the command of warrior retinues, which characterized the Bronze Age. Mature Bronze Age societies from the seventeenth or sixteenth century BC onwards ([Meller et al. 2013](#)) were therefore much closer to later Iron Age societies, and on an evolutionary scale they are rather more like archaic states, or stratified societies in Morton Fried's terminology ([Fried 1967](#)). The inability to see this structural difference between Neolithic and Bronze Age society is often based upon a typological misconception of societies as defined by a descriptive list of archaeological traits, which are then used to draw

direct parallels between Neolithic and Bronze Age tell societies. What is critical is how those traits are *organized* (instituted) as political systems that structure social segments, in particular power arrangements. Even more critical is to understand the geographical *scale* of the economy, and thus the balance between wealth and staple finance. This balance changed dramatically during the Bronze Age, which accounts for the qualitative differences that separated the two historical epochs, with correspondingly different world-views and power structures as a result.

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